THE NATIONAL GEOGRAPHIC MAGAZINE

Vol. XII MAY, 1901 No. 5

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AN ILLUSTRATED MONTHLY, published for the NATIONAL GEOGRAPHIC SOCIETY, of Washington, D. C., by McCLURE, PHILLIPS & Co., at 141 East 25th Street, in New York City, to whom all business communications should be addressed. Editorial communications should be addressed to the Managing Editor of the NATIONAL GEOGRAPHIC MAGAZINE, Corcoran Building, Washington, D. C.

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THE POPULAR SCIENCE MONTHLY for May contains a series of articles of interest not only to students of science, but to all readers who wish to keep informed of scientific progress, even though they may have no special scientific knowledge. The number opens with an article by Dr. W. J. Holland, Director of the Carnegie Museum at Pittsburg, describing the institution which Mr. Carnegie has so liberally endowed, and which it is said he intends to make the greatest institution of its character in the world. The article is fully illustrated, and includes plans for the enlargement made possible by Mr. Carnegie's recent gift of $3,000,000. President David Starr Jordan, of the Leland Stanford Jr. University, contributes an article entitled "The Blood of the Nation," in which, as a student of the theory of biological evolution, he points out the causes which lead to national efficiency and to degeneration by the survival of the unfit. Dr. Frederick A. Cook, one of the members of the Antarctic Expedition that penetrated furthest south, describes the auroras of the southern sky, which have never before been portrayed and illustrated. Professor R. H. Thurston, Director of Sibley College, Cornell University, contributes an article on the progress and tendency of mechanical engineering during the nineteenth century, a subject of very general interest treated by the most competent authority in America. Brother Potamain, Professor of Physics in Manhattan College, gives an account of Gilbert of Colchester, the founder of modern magnetism and electricity, the tercentenary of whose death is being celebrated this year. Professor E. A. Andrews, of the Johns Hopkins University, in an illustrated article describes many interesting and curious facts regarding frogs that take care of their young. Mr. Havelock Ellis, Editor of the Contemporary Science Series, continues his study of British genius, the present article being devoted to childhood, youth and education. The number, as usual, contains short contributions, giving the most recent information regarding scientific literature and scientific progress.

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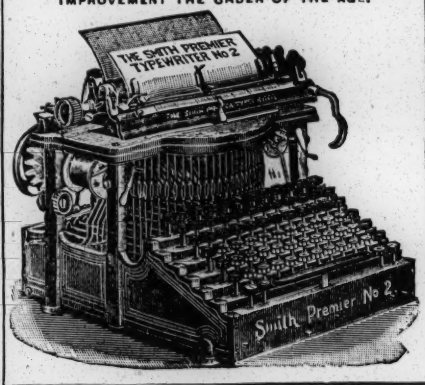

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VOL. XII, No. 5 WASHINGTON MAY, 1901

THE NATIONAL GEOGRAPHIC MAGAZINE

THE LATIN-AMERICAN CONSTITUTIONS AND REVOLUTIONS

BY JOHN W. FOSTER, EX-SECRETARY OF STATE

ON attaining their independence, the Latin-American republics modeled their forms of government after that of the United States. In almost all their constitutions the article relating to the executive power, like that of the United States, contained no prohibition against the reëlection of the President. But a bitter and bloody experience has caused them, with nearly the same degree of unanimity, to revise their constitutions in this respect.

The provisions of the existing constitutions of those countries relating to the executive may be briefly enumerated as follows: In Mexico the president is chosen for four years by an electoral college, and no prohibition exists against a reëlection. The cause of this exception to the general practice will be referred to later. The secretary of foreign relations succeeds to the presidency on the death or disability of the president and orders a new election. In the five Central American States the provisions vary as to the manner of election and term of office, but in most of them the president is made ineligible for reëlection for the next succeeding term. So, also the prohibition against reëlection to be noted in the countries which follow is in almost all cases for the next succeeding term only. In Colombia the president is chosen by an electoral college for a period of six years, and is made ineligible for reëlection. Ecuador elects its president by the direct vote of the people for the term of four years, and he cannot be reëlected. The vice-president is elected for the same term, but two years after the president. Peru elects its president by a direct popular vote for four years, and he is made ineligible for the next four years. Two vice-presidents are elected. Bolivia has the same provision as Peru. In Chile the president is elected by delegates chosen by the people for the term of five years, and he is made ineligible for the next term. The Argentine Republic elects its president by electors chosen by the fourteen provinces for six years, and both the president and vice-president are declared ineligible for reëlection. In Uruguay the president is elected for four years, and made ineligible for the suc-

ceeding term. In Paraguay the president is chosen by a direct vote of the people for four years, and both president and vice-president are non-eligible for eight years. Brazil, the last of these countries to assume a republican form of government, and profiting by the experience of its neighbors, provided for the election of its president by a direct vote of the people for four years, and made him ineligible for reëlection. Its constitution also contains a provision that the candidates must not be related by blood or marriage to the outgoing president or vice-president in the first or second degree. In Venezuela the choice of the chief executive is somewhat complicated. Congress consists of two houses, the representatives being elected for two years by the people, and the senators for four years by the state legislatures. A federal council of nineteen members is chosen every two years by the congress, who elects a presiding officer from their own number, and he is president of the republic for the two years. Neither the president nor council can be reëlected for the next term.

When these countries declared their independence and first essayed the practice of republican government, they soon found that the greatest danger to their institutions arose from the disposition of the chief executives to prolong their power by continuance in office, in violation of the constitutional provision. Iturbide, the first president of Mexico, betrayed his trust, declared himself emperor, and dissolved the congress by force, precipitating the country into revolution and paying the penalty with his life.

Simon Bolívar, the most renowned of the Spanish-American patriots and the one who did most to achieve the independence of the South American countries, marked his entire career by overriding their constitutional provisions as to the executive and by assuming dictatorial powers. As early as 1813 he captured Caracas from the Spaniards and set up the government of Venezuela, but he at once declared himself dictator, established a court and bodyguard, and assumed royal dignities. He soon became unpopular, met with reverses, and had to flee the country. Returning after some years, he led the insurrectionary movement which gave final independence to Venezuela and Colombia, and thence went to the aid of the struggling Peruvian patriots, achieved their independence, and was made dictator of that country. Having failed in his effort to secure a provision in the constitution making himself president for life, he returned to Colombia, where he was chosen president of the united states of Colombia and Venezuela. Seeking in vain to secure a constitutional provision giving him practically absolute power, he declared himself dictator. Being suspected of desiring to make himself a king, he lost his popularity, was driven from power, and died in retirement. He was called "the Washington of South America," but beyond his gallant services in securing the independence of the northern states of South America, he had little in common with Washington in his conduct or character. The example of the latter was lost upon him when he rejected the offer of the American army to make him king, and when, after having enjoyed the free suffrages of his countrymen as President, he voluntarily laid down the great office and retired to private life.

If the history of the Latin American republics is carefully examined it will be seen that the cause of most of the revolutions which have darkened its pages, decimated their population, and retarded their development has had its origin in the efforts of the public men of those countries to continue themselves in power or to attain the presidency by other than peaceful and constitutional methods. With rare excep-

tions the revolutions and bloody contests of these republics for the past three-quarters of a century have been purely of a personal character, the struggles of the partisans of one aspiring individual against the partisans of his ambitious opponent. One of the most notable exceptions was the war of reform waged in Mexico for ten years, beginning in 1857, by the liberal party against the united power of the clergy and Emperor Napoleon. That was a heroic war, involving great principles of government.

I can probably best illustrate the historical fact of this personal cause of revolutions by a very brief sketch of the experience of two of these republics—one the most revolutionary and the other the most conservative and prosperous of the Spanish-American countries.

Venezuela, on its separation from Colombia in 1831, chose Paez president. He filled out his term, and in 1835 sought by his official influence to transfer the presidency to Vargas, who was very unpopular, and within four months was overthrown and banished. Paez came from retirement, gathered an army, took the capital, reinstated Vargas, and, ultimately succeeding him, was made dictator. In 1847 he transferred the presidency, against the protest of congress, to Monagas, who caused his soldiers to invade the assembly, killing some and dispersing the rest. Paez finally took up arms against the government, but was outlawed, defeated, and escaped to New York. In the election to succeed Monagas three candidates were in the field, and as none had the constitutional majority, the election went to congress, and Monagas' brother Gregorio was selected, and until 1858 the two brothers alternated in the presidency. In that year their career ended by a revolution, which created a provisional government that brought in Castro as president; but his was a turbulent reign, and he was displaced by Gual, who tried and convicted Castro as a traitor and then pardoned him. Tovar succeeded by election to the presidency, and he recalled Paez and made him commander-in-chief of the army, but the latter quarreled with Tovar, compelled him to abdicate, and placed Gual again in the presidency. Gual likewise lost the favor of Paez, the president and his ministers were imprisoned, and Paez was declared dictator. Revolution and anarchy followed for two years, when Paez and his partisan, Rojas, had to surrender the government to the insurgents under Falcon in 1863. A constituent assembly and a new constitution followed in 1864, and Falcon, the insurgent leader, was declared president, and he turned the government over to his partisan, Trias, which occasioned a new revolution, and general anarchy and financial distress prevailed. In 1867 congress gave unlimited powers to the president, but the next year Monagas, after defeating Falcon, succeeded to the presidency, and died in office. His adherents made Pulgar provisional president, but the Falcon party, led by General Guzman Blanco, were enabled to overturn the provisional government, and Blanco entered upon his checkered career, covering several years, in which he assumed dictatorial powers, to be at last rejected by his country, and he spent the last years of his life in Paris, enjoying luxurious ease with his ill-gotten fortune. He was followed by a list of constitutional and revolutionary rulers, in turn, up to the actual president, Castro, who came to power through force and betrayal of his chief.

Let us turn from this dismal narrative to a less dreary story, but one which illustrates as well the point which I am seeking to make clear. Chile has had from the beginning of its existence a more fortunate career, in that its wealthy and more intelligent citizens have usually controlled the government, and as a result it has prospered and its financial credit has led all the other states. But

it will be seen that when private animosities or personal ambitions were awakened, constitutional provisions were of little avail. After Chilian independence was secured, General O'Higgins was called to the head of the government and became dictator, but he was finally driven from power by a revolution and Freire was chosen president in 1823. He remained in office three years, but was troubled with frequent insurrections, and the four years following his retirement saw six dictators. In 1828 a new constitution was promulgated, and in 1831 Prieto was chosen president, and from that date for many years a constitutional form of government was enjoyed, although defeated candidates for the presidency more than once organized unsuccessful revolutions on the ground that they had been defrauded in the elections. In 1890, near the close of Balmaceda's term, he was suspected of selecting the chief of his cabinet to be his successor. This choice was contrary to the wishes of the majority of the congress, which body refused to vote the budget appropriations, and Balmaceda retaliated by dissolving congress. The leaders of the latter went on board the government fleet, which pronounced in favor of the Congressional party, and thus a revolution was inaugurated which resulted in the overthrow of Balmaceda. One of its evil effects was to bring about complications with the United States nearly ending in war, and which have embittered the Chilians strongly against our Government.

The record of all the Latin-American republics has not been as bad as that of Venezuela, though some of them equal it in their history of anarchy and misrule, and few, if any, of them have even as clear a record as that of Chile; but they all teach the same lesson of inability to respect the constitutional provision as to the executive power, when a fierce electoral campaign is carried on. Such a test as came to the Congress of the United States following the Jefferson-Adams campaign of 1800, the Jackson-Adams-Crawford-Clay campaign of 1824, or the Hayes-Tilden campaign of 1876, would almost inevitably bring about a revolution or a disregard of the constitution in any of the Latin-American States.

The experience of the past year demonstrates the lesson of their history. We have been reading the almost daily reports of the revolutionary movements in Venezuela and Colombia. The disorders in Venezuela had their origin in the election about three years ago, when Andrade was declared to be chosen president over his competitor, Hernandez. The latter contended that he was the real choice, and his partisan, General Castro, took up arms to place his candidate in the executive chair. Castro defeated the government forces and drove Andrade from the country, but in place of installing Hernandez in power Castro imprisoned him, and declared himself president. Hernandez succeeded in escaping, and both he and Andrade are now reported to be seeking to drive the usurper from power; but even if Castro is displaced the two claimants will still have their own contest to settle. A late telegram states that a constitutional convention has been convoked by Castro, and that this body will frame a new constitution, with an article extending the president's term of office from two to seven years.

President McKinley, in his last annual message, stated that "the executive power of Colombia changed hands in August last by the act of Vice-President Marroquin in assuming the reins of government during the absence of President San Clemente from the capital." This gave rise to armed resistance, and we have had for months the periodical announcement that the revolution had been put down, only to break out again with fresh vigor. The diplomatic representative of the revolutionists recently announced from New York that

"the liberals will never consent to serve again under a president forced upon the people by the conservatives." The New York *Independent*, in seeking to give its readers an account of affairs, says: "The revolution in Colombia that was said to be put down some months ago is alive again and widespread. It is a most remarkable fact that this revolution has caused the loss of thousands upon thousands of lives, and yet no one seems to know anything about it. Cities are taken and retaken, generals are killed, neighboring republics are accused of helping the insurgents, business is paralyzed, towns are razed to the ground, and yet there seems to be no principle involved, nor wrong to be redressed by either party's victory."

I have noticed the provision of the constitution of Brazil, one of the most recent, which, in addition to the prohibition of reëlection, makes ineligible to the presidency candidates related by blood or marriage to the outgoing president in the first or second degree. This is intended to strike at an evil akin to the continuance in power of the incumbent—the perpetuation of the same family influence in the executive office. We have seen that in Venezuela two brothers alternated for some years in the presidency, until overthrown by revolution. Two of these republics are today governed by the same family, one president making way at the end of his term for another member of the family.

Owing to the sad experience of the past, the Latin-American States have, as we have seen, with a great degree of unanimity attempted to remedy the evil by inserting in their constitutions a prohibition against the reëlection of the chief executive; but that has proved in many cases a most ineffectual remedy, because the men who are ready to resort to arms to secure what they claim as their rights seldom hesitate to disregard the constitution, or else find means to amend it to suit the exigency.

I have referred to the fact that one of the exceptions in existing constitutional prohibitions of reëlection is to be found in the fundamental code of Mexico. The circumstances which have brought this about are peculiar and interesting. The constitution of 1857, still in force, contained no such prohibition. General Porfirio Diaz was twice a candidate for president against Juarez, and he claimed that he was the people's choice, but had been counted out by the administration officials who had control of the elections. Lerdo, the head of the cabinet, became president upon the death of Juarez, and when the time approached for the election upon the expiration of Lerdo's term, Diaz announced to the country that it was useless to stand as a candidate, because of the absolute control of the electoral college by the government. He therefore issued a *pronunciamento*, declaring for an amendment of the constitution, and with the cry of "no reelection," he organized a revolution which was successful. Lerdo and his cabinet fled to the United States, Diaz assumed the presidency, ordered a new election, and was unanimously chosen. The constitution was in due course amended so as to prohibit the reëlection of the president until four years after his first term had expired.

At the end of his term Diaz retired from office, and his favorite general was elected his successor. The latter proved so inefficient and dishonest that at the end of his term all classes clamored for the return of Diaz, whose first administration had been quite a successful one. His second term was even more successful than the first. Peace and security prevailed throughout the land. Commerce, agriculture, mining—every industry of the country—prospered as never before. Railroads were built, capital began to flow in from abroad, the government credit, which had been utterly discredited for nearly half a century, was fully reëstablished. No one

would listen to his retirement, and so the prohibiting amendment was stricken out of the constitution, and Diaz was again chosen president; and he has again and again been reëlected without any open protest, and for a quarter of a century he has been the untrammeled ruler of Mexico. Every one conversant with the history of that country concedes that he is the best ruler it has had since the independence. He has given it peace, order, and the reign of law. It has risen phœnix-like from the ashes of anarchy and commercial death, and the praises of Diaz as an administrator and a patriot are sounded at home and abroad.

But what becomes of the principles of republican government? Diaz, through his strength of character and wise government, has been the supreme ruler, although acting through the channels of constitutional authority and representative institutions. This example may raise the doubt whether republicanism in its extreme form is adapted to these countries, or whether some limitations should not be placed upon it. The present is probably Diaz' last term, as he is now past seventy, and I believe he is sincere in his expressed desire to retire to private life. The test of republican government will come when his successors are to be chosen. Not the first, but probably the second term will test the ability of the Mexicans to choose their rulers in peace and observe republican practices. Mexico, like its southern neighbors, has not yet fully proven its capacity to consistently follow these practices and to peacefully and by constitutional methods transmit the executive power from one ruler to another.

How far the people of these countries are fitted to carry on republican and representative government in our sense opens up a topic which cannot be pursued in this paper; but I offer a few suggestions by way of explanation of the apparent failure in many of them. First, the great mass of their populations are ignorant and uneducated; in many of the countries they do not even read and write the official language of their government, and as a rule take no part in the elections. They, however, compose in the main the armies of the government and the revolutions. Second, the people of these countries, both the educated and the uneducated, had no experience in self-government before their independence. In this respect the British-American colonies had a great advantage over them, and we should be charitable in our criticism of them. The misfortune is, however, that they have had very little practice in genuine republican government since their independence. They understand the force of the bullet much more than the ballot. The result has been the rule of the dictator or usurper more often than that of the real representative of the people. The intelligent men, the best citizens, and the property-holders deplore the revolutions, and they are exerting themselves to put an end to these practices, and their good work is apparent in some of the countries, and I think the general tendency is toward orderly and constitutional government.

This subject has a special interest for the people of the United States:

First. It raises the question how far it is the duty of our Government to interpose respecting an American republic, which has fallen into anarchy, against the encroachments of European powers whose subjects have suffered outrages at the hands of the local military powers? I fully sympathize with the Cleveland administration in its action on the Venezuelan boundary question, but many Americans thought it would have been better for the interests directly concerned if all the territory in dispute had fallen under British sovereignty.

Second. We are often embarrassed as a nation by these frequent revolutions. I have noted how near we came to war

with Chile because of its disturbed condition and the enmity engendered by the action of our Government. We have commerce with all these countries, many of our citizens have invested capital therein, and these interests cannot fail to be injured by the civil disorder occasioned by the strife of ambitious men. Does any one believe that our Government could look on with indifference if our next door neighbor, Mexico, should again fall into anarchy, as at frequent intervals in the past, and the millions of American capital which has been attracted thither by the beneficent rule of Diaz should become the prey of revolutionists and rival aspirants for the presidency?

Third. The Spanish war has made the subject a practical problem for us. The territory which we took from Mexico was soon overrun by Americans, and its government was readily adapted to our system. But Porto Rico is already densely populated with people educated in Spanish-American methods of government. We have already had an exhibition of the embarrassments to be overcome. In the first election held under the territorial organization provided by Congress a practice was resorted to very common in the Latin-American republics—when one party finds itself outnumbered or outwitted in the campaign, it abstains in a body from the election, and then cries fraud or force. We read that in the late election in Porto Rico for the territorial legislature and other offices, one party, the Federals, refused to go to the polls, and the Republicans, as a consequence, elected all their candidates; but in celebrating the victory they were attacked by the Federals, and several were killed and wounded in the affray.

We have by act of Congress become responsible for the establishment and maintenance of a stable government in Cuba. The history of their brethren of the same race in Central and South America does not give much assurance that the Cubans will soon attain the position required by Congress. One of the first steps in that direction which is foreshadowed, the election to the presidency of a professional revolutionist, born and educated in San Domingo, does not argue well for the future. In the election held to choose delegates to the convention to frame a constitution, only a minority of the qualified electors took part, and I have good authority for the statement that fully 95 per cent of the electors representing the property interests of the island abstained from the election.

And yet it appears that this minority of the people of Cuba are to frame its organic code, to set the machinery of the new government in motion, and to determine the relations which are to exist between the new government and the United States.

This review, it must be confessed, does not present a cheerful outlook for the friends and admirers of republican government, but for the citizens of the United States at least it suggests a solace. It is a consolation to us to know that the men who laid the foundations of our Government and have thus far conducted its affairs have appreciated the value of peace and the superior merits of the ballot over the bayonet; that ew had a Washington, not a Bolívar nor an Iturbide, to put the Government in motion, and that the Constitution has been held as too sacred an instrument to be made the sport of ambitious rivals for the presidency.

MEXICO OF TODAY*

By Senor Dr. Don Juan N. Navarro, Consul-General of Mexico in New York City

A GLANCE at our factories shows that our people manufacture acids, chemicals, candles, excellent beer and ale, carpets, furniture, and carriages that have received premiums at some of the Paris expositions, cordage, glassware, hats, matches, paper of every description, sugar, tobacco, and many other articles, the production of which increases every day in quantity and quality. In the last few years the textile industry of Mexico has progressed at a surprising rate, and some of the manufactories deserve special mention. Rio Blanco is a manufactory situated near Orizaba. I personally visited this manufactory a few months ago and found that it produces eighty different classes of linen and cotton goods, has a colossal and tasteful building, and maintains in incessant work more than 3,000 workmen, who make 40,000 pieces per week. I have in my office, in New York, a complete set of samples of all the linen and cotton goods from this manufactory, and all, especially the prints, in the perfection of the work and in the beauty and taste of colors and designs, excite the admiration of all who examine them.

I have not at hand the statistics giving the actual number of cotton manufactories, but I calculate that there must be approximately 150, and that they last year produced more than ten millions of pieces of white and printed goods and nearly two millions of yarn. The sales declared for taxes for the years 1898 and 1899 are more than $29,700,000. Another of the manufactories near the city of Orizaba makes bags for flour, grain, salt, etc. The raw material is jute, a fiber originally imported from East India, which has been planted in Mexico and in all probability will yield a good harvest. This establishment makes 7,000 bags per day and 800 meters of carpets and rugs of the same material. The motive power in these factories is electricity derived from the falls of the Rio Blanco.

The wool manufactories, though not so many, are remarkable for the excellence of their products, and are not often excelled by the best products of other countries. The number of tobacco manufactories is very considerable, and the fame of the excellence of the material and elaboration is spreading day by day in the commerce of the world. Another manufactory worthy of mention is the one in Merida for cordage. The capital invested in mounting it was $600,000, and up to September of last year there were exported to this country by way of the port of Progreso more than two millions of kilos of the *henequen* cordage there manufactured.

Our government has promised certain privileges for the introduction of new industries into the country, and the department for correspondence has received 114 applications.

I have always believed that Mexico is destined to be not only an agricultural but an industrial country, as it produces a great number of vegetable raw materials and possesses an incomparable quantity of every known metal, and has living in cities a good part of its population who have a decided inclination and a remarkable ability for mechanical labor. The facts of her development are confirming these views.

*Continued from the April number.

The scientific boards and establishments of the government render good services to science in general and particularly to our country. There is a geodesical board that, besides other scientific occupations, is measuring the part of the arc of the meridian corresponding to Mexico.

La Comisión Geografica Exploradora (the geographical exploring board), in order to make a correct map of the republic on a large scale, is now working in the States of Nuevo Leon, Vera Cruz, and Tamaulipas. The topographical surveys measure an area of 424,148 square kilometers, the itineraries 142,799 lineal kilometers, and the number of positions astronomically determined is 424. The learned members of this Society can appreciate properly the time and scientific labor represented by these operations.

Our astronomical observatory in Tacubaya, Federal District, is in constant communication with similar institutions in the civilized world, and our directors have visited them repeatedly and been present at the astronomical congresses of all nations. It has also the honor of taking part in the formation of a photographic zone of the celestial map that is to be executed by international convention.

Speaking of this science, it is worth mentioning that Mexico, since colonial times, has always had remarkable astronomers, and in the seventeenth century the illustrious Don Carlos de Sigüenza y Gongora, of European renown, was appointed by Charles II of Spain his royal cosmographer. In our times we had Diaz Covarrubias, and in fact Mexico, since the sixteenth century, has taken a prominent part in all astronomical observations, and was one of the many countries to observe the transit of Venus through the disc of the sun more than 100 years ago.

There are also meteorological observatories in connection with those of the United States, and a geological institute, one of whose works, the geological cut from Acapulco to Vera Cruz, figured very advantageously in the last Paris Exposition, and many other scientific institutions supported by public funds or by private enterprise.

To give some idea of our means of communication and public works, I shall mention some facts about our railroads, telegraphs, telephones, and postal service, and of some of the great works in the capital and states.

Besides many hundreds of miles of railways in active construction, we have in actual operation 14,573 kilometers, or 9,055.22 English miles. In the last four years 3,104 kilometers of roads were finished.

Mexico being a mountainous country, the cost of these roads in many cases was enormous; but we can boast of having some of the most daring and magnificent works of engineering and of the most picturesque views in the world. One of the two railroads connecting the capital with the port of Vera Cruz has a section literally above the clouds, and, according to the opinion of foreigners visiting the country, the trip of any tourist would be amply repaid by only traveling on that magnificent railroad, so solidly and skillfully built and cautiously run that an accident of a serious nature has never happened in more than 28 years of continual operation. For construction and splendid scenery, the railroads running from Morelia to Uruapan, in the state of Michoacan, and from Puebla to Oaxaca, connecting the two states of said names, can be especially recommended.

The number of passengers increases at an enormous rate year by year. In 1893, 22,781,343 passengers were carried on Mexican railways; in 1900 this number had nearly doubled, exceeding 40,000,000. Of merchandise, 3,798,360 tons were carried in 1893, and in 1900 nearly 8,000,000 tons.

The development of our telegraphs has kept pace with the railroads, and today there is not a place of any importance that is not connected telegraphically with the rest of the republic.

Our telegraphic lines are divided into four different branches—federal lines, state lines, private company lines, and railroad lines—and the federal lines last November had an extension of 45,740 kilometers, or 28,421 English miles. President Diaz in his last report mentions only the federal lines, but, according to the statistical annuary, of the state lines there were, on December 1, 1898, 8,659.4 kilometers; of lines belonging to private companies, 3,690.240 kilometers, and of railroad lines, 11,198.195 kilometers. Adding these lines to the 45,740 kilometers of federal wire and we have a total of 69,287.881 kilometers, or about 43,053 miles.

The extension of telephone lines in December, 1898, was 28,433 kilometers, but in the last two years many more lines have been constructed, and we can estimate that there are now 30,000 kilometers, equivalent to about 18,641 English miles. The number of messages transmitted by federal telegraph only during the year 1892-'93 were 1,083,359, and during the last year, 1899–1900, this number had more than doubled.

The federal offices in the capital and other principal ones are open day and night, and the night service has been so well patronized by the public that it covered its expenses almost immediately after being established.

Our telegraph lines are connected at different points with those of the United States and by two submarine cables—one from Galveston to Tampico and the other from Tampico to Vera Cruz. Through the United States we are in communication with any part of Europe, while the United States, through our telegraph lines from the Atlantic to the Pacific Ocean and a cable from Salina Cruz to Libertad, communicates with the greater part of South America as far as Brazil and Chile, and by land with Guatemala and the other Central American republics. We have one telegraph cable at Alvarado Bar, and three others between Tuxtepec and Cosamaloapam, another between Champoton and Campeche, and one between San Juan Bautista and Nopalapam.

Our government has established a school of telegraphy where girls receive gratuitous instruction.

Our postal system is continually studied and improved, and the results obtained are of the most gratifying order. The number of offices in 1900 was 1,972, including 96 on railroad cars.

The public works completed and those in the course of construction are too numerous to mention. Two, however, the drainage canal of the valley and city of Mexico and the great docks and wharves in the port of Vera Cruz, deserve special consideration, because of their colossal magnitude and importance.

The city of Mexico is situated in an extensive and beautiful level valley, surrounded by lofty mountains. There is no natural exit for the water that pours from the mountains or for the refuse of a large city. In consequence the inhabitants were exposed to the perils of floods which at different times in the past became a reality. The Spanish Government early took the matter in hand and approved the project of the celebrated engineer, Enrico Martinez. He constructed the gigantic cut now in existence and known by the name of "Tajo de Nochistongo." But, although that work had averted the danger from the side of Cuautitlán, deviating the course of the river of that name, it did not solve the whole problem. The solution as completed was first proposed by another Spanish engineer, Simon Mendez, whose plans, with some modifications, constitute the work now finished.

The work was undertaken and suspended several different times for the want of funds and the uncertainties produced by revolutions.

In the year 1885 it was resumed in earnest, and incessantly and vigorously prosecuted until its completion, by General Diaz, who, with his usual activity and energy, put it under the direction of a board of distinguished citizens. The Mexican engineer, Dr. Luis Espinosa, was the technical director, who modified advantageously the original plan and brought it to a happy termination with an ability, energy, and constancy that deserve the gratitude and admiration of all his fellow-citizens.

The completed works consist of a canal, with a length of 30 miles, and a tunnel of more than six miles. The canal runs from the northeastern section of the city, called San Lazaro, to the town of Zumpango. There the enormous mass of water enters the tunnel cut through the mountain, and on the other side disgorges into the ravine or Barranca de Tequisquiac, in which it is confined till it reaches the Gulf of Mexico. The works are laid out in such a way that when the system of canalization of the streets of the city is finished, according to the plans presented by another distinguished engineer, Dr. Roberto Gayol, the water of the lakes, principally of Texcoco, which is the lowest, will be controlled, and Mexico will be perhaps the only city in the world which will be able to wash its sewers every day. This last work is being vigorously pushed, and it is expected will be completed during the last months of the present year. Mexico has good reason to be proud of this magnificent work, which has cost her many millions of dollars.

A few words will give some idea of the magnitude and usefulness of the public works in the port of Vera Cruz. The city of Vera Cruz was founded by the Spaniards for military and not for commercial purposes. It was planted within the fire of the guns of the fortress, San Juan de Ulua, which they had built on a rock in the bay. The port was a bay, or rather an open roadstead, where ships could find no protection in a storm. Often the shipmasters preferred to lift anchor and battle with a tempest on the high seas. Today the old fortress is a part of the city, and can be reached by carriage, and the open roadstead has been converted into a safe port, with wharves for the largest vessels and every convenience for the landing of passengers and the loading and unloading of ships.

In many other ports on the Gulf and the Pacific Ocean improvements are being constantly made In Tampico a new wharf is nearly completed to replace the one destroyed by fire in 1888. In San Juan Bautista four wharves have been finished. The fiscal wharf in Frontera is completed and in use, and also the one in Progreso. Very important works are in progress in the ports of Salina Cruz, the Pacific end of the Tehuantepec Inter-Oceanic Railroad, and Altata, a port that is to be changed to Tetuan, which offers a better anchorage for vessels.

In the last four years many lighthouses have been built on the coast of Yucatán, in Isla de Mujeres, Cayo Norte, Cabo Catoche, Contoy, Punta Molar, and Punta Calarain and on the Pacific coast, on Morros de Seybaplaya, Salina Cruz, Santiaguillo, Isla de Arcas, Zapotitlan, Cayo Lobos, and Puerto Angel.

(*To be concluded in the June number.*)

THE GENERAL GEOGRAPHY OF ALASKA

By Henry Gannett, Chief Geographer, United States Geological Survey

ALASKA, our northernmost possession, extends over more than 20 degrees of latitude and 45 degrees of longitude—as far as from Florida to Maine and from Maine to Utah.* From the main body of the Territory stretch two projections, one to the southeast, comprising the Alexander Archipelago and the adjacent mainland, the other to the southwest, comprising the Alaska Peninsula and the Aleutian Islands.

The exact area of Alaska cannot at present be known, owing to the fact that the boundaries are as yet located only approximately. The seacoast, which forms by far the greater part of the boundary, has not been accurately mapped, except in small part, while the land boundary on the southeast, which separates our territory from Canada, has not been defined, except in the general terms of the treaty of cession from Russia. Various measurements have been made, based upon different maps, giving areas ranging from 570,000 to 600,000 square miles. A careful recent measurement from the large map published by the U. S. Coast and Geodetic Survey (scale 1:1,200,000) gives its area as 590,884 square miles. Of this the portion lying east of the 141st meridian, popularly known as southeastern Alaska, which is the best known part of the Territory, has an area of 43,710 square miles, of which 30,800 square miles consist of mainland and 12,910 square miles of islands, forming what is known as the Alexander Archipelago.

The Cordillera of North America enters Alaska at its southeastern extremity and follows the Pacific coast around to the Aleutian Islands. Beyond this mountain system and following its general trend is a broad depression, drained by the Yukon River and its tributaries. North of this basin is a height of land which separates the Yukon Valley from the bleak shores of the Arctic Ocean.

THE PACIFIC COAST REGION

This portion of the Territory is mountainous throughout. Although the coast of the mainland and of the islands is, altogether, several thousand miles in length, yet for the entire distance there are very few square miles of level ground. The land rises from the water almost everywhere at steep angles, without a sign of beach, to altitudes of thousands of feet. It is a fiord coast. The islands are separated from one another and from the mainland by fiords, deep gorges, whose bottoms are in some cases thousands of feet below the surface of the water. These fiords extend far up into the mainland and into the islands, in deep, narrow U-shaped inlets.

The relief features of this region, its mountains and its gorges, partly filled by the sea, are all of glacial origin, presenting everywhere the familiar handwriting of ice. Every cañon, every water passage, whether called strait, canal, or bay, is a U-shaped gorge, and its branches are similar gorges commonly at higher levels—"hanging valleys" they have been called. Above

*It lies between latitudes 51° and 71° 30′, extending 5 degrees within the Arctic Circle, and stretches from longitude 130° to 175°. The great body of the Territory lies, however, between latitudes 60° and 71° 30′, and between longitude 141° and 168°.

the cliffs of the gorges the mountains rise by gentle slopes to the base of the peaks. The cross profile of each gorge and its surroundings is that of ice, not of water carving. It is the work of channel erosion, not of valley erosion, and the channels were filled with ice. It is a colossal exhibition of the eroding power of water in solid form. From Lynn Canal, a fiord 90 miles in length, there have been carried off and dumped into the Pacific more than 200 cubic miles of rock, and from all the fiords of southeastern Alaska the amount removed may be safely estimated at thousands of cubic miles. The ice has but recently retreated from these gorges, for since its retreat water has done but little work, although the region is one of heavy rainfall and extremely steep slopes, where aqueous erosion is at a maximum.

Of the great glaciers which occupied this region a short time ago, only trifling fragments remain in the upper ends of the gorges, and comparatively few now reach the sea. I use the word trifling, however, merely in relation to their former extent, for absolutely these remnants are not at all trifling. The ice cap of Greenland and the glaciers of the Antarctic continent alone exceed them in magnitude. All the glaciers of Switzerland together would form but a few rivulets of ice on the surface of the great Muir Glacier, and the Muir is but one of many glaciers of equal magnitude. Indeed, on this coast are scores of live glaciers, glaciers which reach the sea, presenting to it fronts of ice or ice walls rising from the sea bottom to 200 or 300 feet above its surface, and several miles in length, and which drop bergs, with thundering sound, into the sea. Of such glaciers no fewer than 30 were visited by the Harriman Expedition, and many others are known. Of dead glaciers, or those whose fronts do not reach the sea, hundreds are known.

The mountains increase in height toward the northwest, but not at a uniform rate. They culminate near the coast in the Fairweather Range, south of Yakutat Bay, at about 16,000 feet, and in the St. Elias Range, west of Yakutat Bay, at 18,000 feet or more. These ranges are not regular or continuous. While they follow the general direction of the coast, toward the northwest, they are extremely broken, being cut through on the mainland by many fiords and by streams flowing into the heads of the fiords. The Stikine, which reaches the coast near Wrangell, heads far to the eastward, in Canada, and cuts across the entire breadth of the Cordillera system. The same is true of the Taku River, which, flowing through Taku Inlet, reaches the coast near Juneau; and of the Chilkat, which flows into one of the heads of Lynn Canal. Alsek River heads far to the north, in Canada, and cuts a gorge through the great Fairweather Range. These are the main rivers of this coast, but there are many smaller ones, which head either beyond the mountains to the north and east, or far within them.

The coast line from Cross Sound northwestward to Prince William Sound is comparatively smooth and simple, containing no inlet of magnitude, with the exception of Yakutat Bay. As far as Yakutat Bay it is closely bordered by the Fairweather Range, which rises abruptly from 10,000 to 16,000 feet almost from the water's edge, bearing on the summit a succession of peaks and covered with glaciers along both slopes. A day long to be remembered was that on which our ship steamed, between 8 o'clock in the morning and 6 in the afternoon, from Yakutat Bay to Cross Sound, along the entire front of this range outlined against a cloudless sky.

Yakutat Bay is a deep funnel-shaped bay, penetrating far into the heart of the mountain region. At its apparent head it turns sharply upon itself to the south and extends back nearly to the

sea in a narrow fiord, bordered on either side by high mountain walls. This extension, heretofore named Disenchantment Bay, has been rechristened. The story of the locality is as follows: More than a century ago Malaspina, the Spanish navigator, entered Yakutat Bay while in search of the Northwest Passage. Sailing on up the bay and finding that open water extended far inland, he for a time thought that for him had been reserved the fame and satisfaction of discovering the long-sought route through the North American continent. His dream was short, however, for on nearing the bend in the bay he found his way blocked by a solid wall of ice. This ice was the front of the combined Hubbard and Turner glaciers, which then extended far beyond their present limits, completely closing the entrance to the fiord above, which at that time was probably an open lake some 200 feet above the level of the sea and overflowing southward into the Pacific. In memory of his disappointment, Malaspina named the upper part of Yakutat Bay "Disenchantment Bay."

Prof. I. C. Russell, when exploring the head of the bay in 1891, discovered the fiord, and in an open boat traversed it for its entire length. Instead of naming it, he extended the application of the name Disenchantment Bay to cover it. We have rechristened it, in honor of its discoverer and first explorer, Russell Fiord. Our ship, the *George W. Elder*, was the first large vessel to go to the head of this fiord. We made the passage under the pilotage of a Yakutat Indian, and lay at anchor over night at its head.

Northwest of Yakutat Bay for many miles the shore is covered by a field of ice, Malaspina Glacier, which is in the main a stagnant pool, wasting only under the heat of the summer sun, and supplied by ice streams from the St. Elias Alps, which border it on the north and east. Farther to the northwest stretches a low coast, rising into mountains a score or two of miles inland. Through these mountains flows Copper River, at whose mouth is an enormous delta, built up of detritus which it brings down from the interior.

Then comes Prince William Sound, a bay of irregular shape, with many tentacle-like fiords extending in various directions into the land. Its entrance is nearly closed by islands between which are several navigable passages. The islands near the shores are everywhere mountainous, and on the north shore mountains rise to about 10,000 feet, the higher ones everywhere skirted with glaciers, many of which come down into the sea. Several of the fiords are of great length, reaching far inland. Thus Port Valdez, up which the Copper River route to the interior passes, extends inland more than 30 miles, and Port Wells, on the northwest of Prince William Sound, pushes 40 miles into the interior, far up among the high mountains, and each of its branches terminates in a living glacier. Passage Canal, too, up which runs the portage route to Turnagain Arm of Cook Inlet, has a length of 30 miles.

Prince William Sound, in the mountainous character of its shores, in its multitude of islands and fiords, and in the almost total absence of level land, resembles southeastern Alaska. It was until recently but little known, all our information concerning it being derived from the explorations of Vancouver and Malaspina, made a century or more ago. Within the past two years, however (1898 and 1899), exploring parties under Captain Abercrombie and Captain Glenn have supplemented the work of Vancouver and Malaspina, and have added materially to our knowledge of the coast and adjacent lands. Some additional information also was gained by the Harriman Expedition, especially concerning Columbia Fiord and Glacier, and of Port Wells and its glaciers, in the form of sketch maps and photo-

graphs of these localities. The head of Port Wells and a large branch coming in from the west were explored and mapped. This western branch, shown on the sketch map as Harriman Fiord, was in all probability closed at no very remote time by the front of Barry Glacier, which extended across the fiord to the opposite shore; indeed, until our visit, it was still supposed to be closed. In bringing our ship close to the glacier front to obtain photographs of it, our party discovered the opening between its point and the land, and as we steamed through we saw unfolded before us a magnificent vista of mountain and glacier.

> "We were the first that ever burst
> Into that silent sea."

It was sunset when we entered the portals, and through the long twilight of the Arctic evening we passed up the fiord, with mile-high mountains and great glaciers on either hand. A little before midnight we reached its head, where it is terminated by the front of Harriman Glacier. A surveying party was landed there, and two days were spent in making a reconnoissance of the fiord and its surroundings. In this fiord, in a length of 15 miles, there are, besides a score of "dead" glaciers, five live glaciers, four of them of the first magnitude, and all reaching the sea and discharging bergs into it.

The general direction of the coast, which trends northwest to a point beyond Mount St. Elias, gradually swings to the westward, and beyond Prince William Sound turns toward the southwest in the Kenai Peninsula. Beyond the end of this are mountainous islands — Afognak (594 square miles) and Kadiak (3,642 square miles), the latter the largest island in Alaska waters. These continue the line of Kenai Peninsula to the southwest, and are separated by the waters of Cook Inlet and Shelikof Strait from the Alaska Peninsula. This latter peninsula bears the backbone of the mountain system which follows the coast, the westward extension of the Cordillera. Of its structure little is known, except that here and there are upturned stratified beds and occasional volcanoes, some extinct, others still smoking, as if the internal fires were banked but not extinguished. Among these are Redoubt, Iliamna, St. Augustine (on an island near the coast), Pavlof, and many others. Beyond the west end of the Alaska Peninsula its general direction is continued by groups of islands and islets, as if the mountain range of which it is composed were sunken below the sea and only the summits of its peaks protruded above the waves. These are the Aleutian Islands. Upon them also are many volcanoes, some alive, some dormant.

BERING SEA

Just north of the Aleutian Islands, which run in a broad curve, convex southward, over ten degrees of longitude, are two islands, Bogoslof and Greminck. These are very young, the older having come into being 104 years ago, the other being but 17 years of age. Only half a generation ago it rose from the sea with great fury and turmoil of escaping steam, and although for 17 years its shores have been bathed in the icy waters of Bering Sea and its summit wrapped almost constantly in chilling fogs, it is still hot and gives out steam. Its older brother has long since cooled and is now the nesting place of millions of birds and the breeding ground of hundreds of sea-lions.

North of these rocks, far in the gloom of the eternal fogs of Bering Sea, lie the Seal Islands, or Pribilofs, St. George and St. Paul—little islands of hills and gentle slopes of tundra, clothed in summer with a rich mantle of grass and flowers. Still farther north, in the midst of this dreary sea, where the sun seldom

shines, are St. Matthew and Hall Islands, buttressed by cliffs, above which are undulating slopes of tundra, grassy and gay with flowers, and beyond them St. Lawrence, a mountain island fringed by a boggy plain.

The Alaska coast of Bering Sea is mainly low and marshy, rising very gently inland, and consisting almost entirely of tundra. The Yukon, the great river of Alaska and one of the great rivers of the earth, ends its long journey seaward in an enormous delta, which covers thousands of square miles. Through this great area of low level land its distributaries meander sluggishly to the sea, bringing from the interior mud and gold and driftwood, to be spread along the coast by the currents.

Such is the Alaska coast: where it faces the Pacific, bold, rugged, and bordered throughout by a mountain barrier; where it faces Bering Sea, low, tundra-clothed, and affording easy access to the interior by means of its great river.

THE INTERIOR

Of the interior of Alaska we know much less than of its borders. Not only did the early explorers confine their attention almost entirely to its coasts, but the inhabitants, both natives and Europeans, owing to the difficulties of land travel in the interior, have always lived upon the coast or upon the larger streams, and have made their journeys by the water routes. It is only in recent years that definite geographic information concerning the interior has been obtained, and at present, through the extensive explorations carried on by the U. S. Geological Survey and officers of the U. S. Army, such information is rapidly increasing.

The primary slope of the land is toward the west and southwest, as is indicated by the courses of the great rivers of the Territory—the Yukon, Kuskokwim, Koyukuk, and others. The trend of the mountain uplifts, on the Pacific side, swings around from northwest to southwest, thus following the general course of the coast. Of the great features of the Territory this chain forms the southernmost, and is the key to the structure of the country. Succeeding it on the north is the great valley of the Yukon, which is separated from the Arctic coast by ranges of low mountains and broken country, probably nowhere exceeding 5,000 or 6,000 feet in altitude.

The Cordillera attains its greatest breadth and altitude between longitudes 142° and 152°. Here are many summits reputed to exceed 12,000 feet in height, with Mount Wrangell, said to be 17,500 feet, and Mount McKinley,* so far as known, the highest summit on the North American continent, rising to an altitude of 20,464 feet. In this portion of the mountain system are the sources of many large rivers, the White, a branch of the Yukon; the Copper, well named on account of the enormous deposits of copper ore found near it; the Sushitna, flowing into the head of Cook Inlet; the Tanana, another branch of the Yukon, and finally the Kuskokwim, which, heading in the western part of this group, flows southwest into Bering Sea. In the region north of the Yukon Valley originate many streams, including several large branches of the Yukon, as the Porcupine and Koyukuk; other streams, as the Noatak and Kowak, flow into Kotzebue Sound, and still others, as the Colville, flow northward into the Arctic Ocean.

The country is intersected by a network of rivers and lakes navigable for canoes, although navigation is much interrupted by rapids and falls. The great highway of the Territory is the Yukon River, which, heading in British Columbia, flows northwestward through a succession of lakes and rapids, and

* Longitude 149°, latitude 63°.

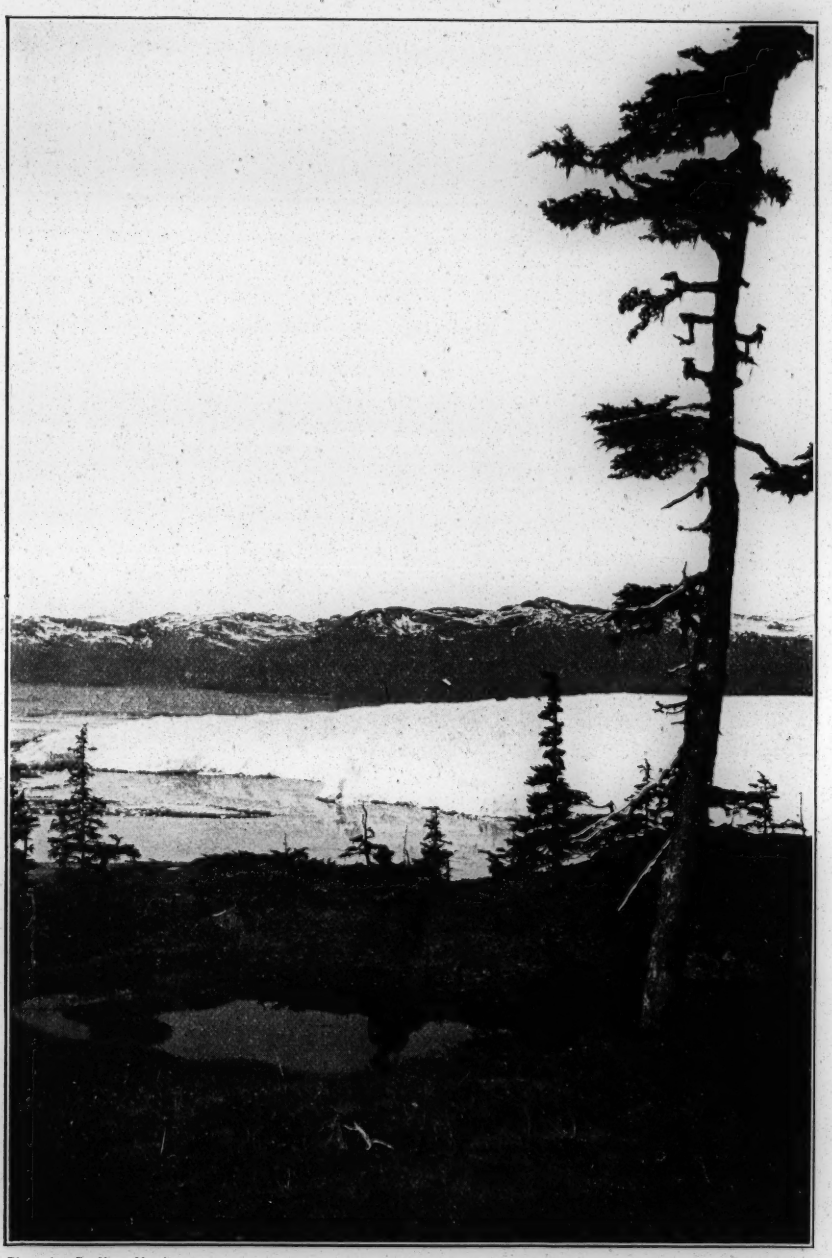


Photo by C. Hart Merriam

End of Columbia Glacier, College Fiord

crosses the boundary line in latitude 65°. It reaches its most northern point just on the Arctic Circle, in longitude 146°, and thence flows southwestward to its mouth. It is navigable for small steamers throughout its course in Alaska, and when not closed by ice—that is, from June to October—carries much traffic, since nearly all of the food, supplies, machinery, and other goods for the support of the mines in Alaska and the Klondike come by this route.

North of the Yukon most of the land is permanently frozen at a depth, thawing only near the surface in summer. Whenever the slopes are at all gentle such ground is marshy, forming the well-known tundra of the Arctic regions.

CLIMATE

We must speak of the climates rather than the climate of Alaska, for different parts of the Territory differ in climate, not in degree only, but in kind. The Pacific coast has a climate of its own, the coast of Bering Sea has another, and both differ widely from that of the interior.

The climate of the Pacific coast, from Portland Canal in the extreme southeast to Attu Island at the west end of the Aleutian chain, may be characterized, in a word, as "chilly." Take the well-known climate of San Francisco, with its dampness, fogs, and cold sea winds, reduce the temperature 15 to 18 degrees and increase the dampness and fog in proportion, and you have a fair idea of the climate of the Alaska Pacific coast. At Sitka, in latitude 57°, the mean annual temperature is 43° Fahrenheit, which is about the same as at Eastport, Maine, 12 degrees farther south. The extreme range of temperature on record

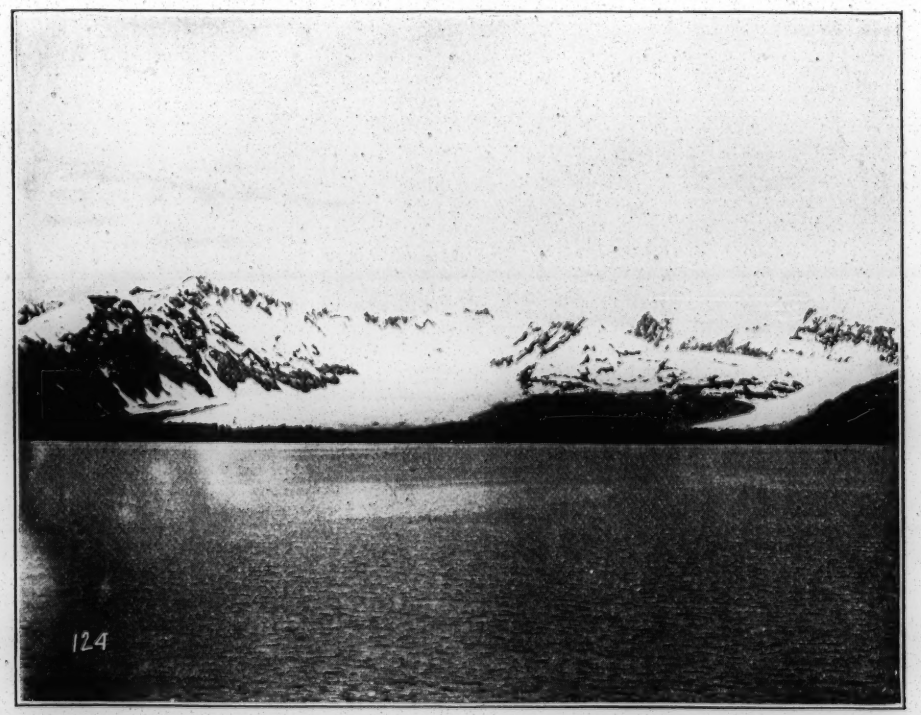


Photo by C. Hart Merriam

Amherst Glacier, College Fiord

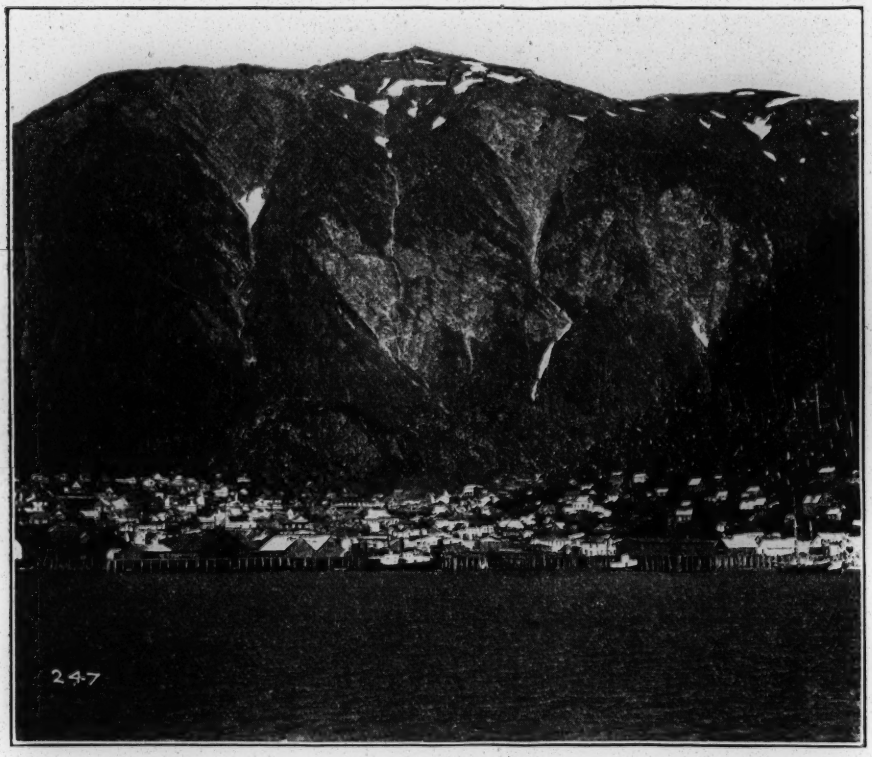


Photo by C. Hart Merriam

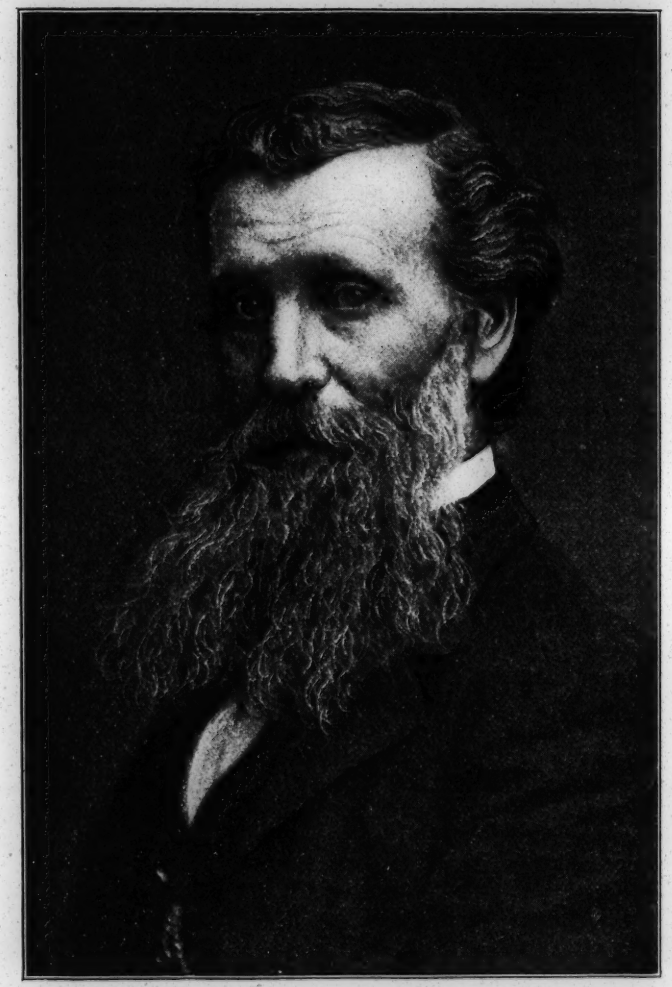
Juneau

at Sitka is from a trifle below zero Fahrenheit to 90° above, and the monthly mean temperatures range from 31° to 56° only, illustrating the wonderfully uniform temperature of the Pacific coast. At Kadiak, 16 degrees farther west and a degree farther north, the mean temperature is 2° lower and the extreme range of temperature less. At Unalaska, 3 degrees south of Sitka, the mean temperature is only 36° and the range of temperature is still smaller.

While the mean annual temperature on this coast, whose latitude ranges from 54° to 60°, does not differ materially from that of Eastport, Maine, on the Atlantic coast, in latitude 45°, the summer temperature is much colder and the winter temperature much warmer. The statement has been made that it is no colder at Sitka than in Georgia. I believe this to be true in the sense that the minimum temperature is no lower; but it represents only a part of the facts, and much the less important part. It is also true that it is no warmer at Sitka than in Greenland or Labrador—that is, the maximum temperature is no greater; and for most economic purposes, except the making of ice, it is warmth, not cold, that concerns us.

The annual rainfall is heavy over this entire coast. At Sitka it is more than double that of the Atlantic coast, 105 inches a year being the record, and it diminishes but little westward. At Unalaska the record is 92 inches. Rain falls mainly in the autumn and winter, the summer being comparatively dry.

A description of climate would be in-



John Muir

complete if it did not include the amount of sunshine and cloudiness, since these are important factors in the growth of plant life. At Sitka it is cloudy two-thirds of the time, and nearly half of the time it is raining or snowing. At Kadiak the conditions are a little better; at Unalaska they are worse, for Unalaska is unrivaled for bad weather. Only 8 days in the year during several years of record were entirely clear and only 45 partly clear, the remaining 312 being cloudy, and 271 of those were rainy or snowy.

Before attempting to explain these peculiarities of climate, it should be stated that the sea commonly produces two modifications of temperature. It may reduce the extremes, making the atmosphere cooler in summer and warmer in winter, and it may reduce or increase the mean annual temperature. The Pacific coast of Alaska is within the range of the prevailing westerly winds of the northern hemisphere. These winds come off the ocean, bringing to the coast the temperature of the sea. As the sea absorbs heat slowly, in comparison with the land, and parts with it as slowly, the winds blowing off it are cool in summer and warm in winter. Moreover, since the ocean has waves, tides, and currents, by which its waters are moved about, the cold water of the north toward the south and the heated water of the tropics toward the north, there is a tendency to establish an equilibrium of temperature. Thus the northern seas are warmer, on the whole—that is, the mean annual temperature is higher—than land in the same latitudes, and through the agency of the westerly winds the coast shares in this amelioration of temperature.

These same westerly winds are responsible for another feature of the climate, the heavy rainfall. They come from the sea saturated with moisture, and if they find the land colder than they are, as it is in fall and winter, they are chilled below the point of saturation and disgorge copiously; but if they find

Photo by Curtis

An Indian Totem

Photo by C. Hart Merriam

Eskimo at Plover Bay, Siberia

the land warm, as it is in summer, they carry their moisture inland and the coast enjoys a comparatively dry season. This season is, however, dry only in comparison with the winter, the wet season. The rainfall of the three winter months at Sitka is commonly about 30 inches, while that of the three summer months is 16 inches, or more than half that of winter.

The fogs of this coast, really the most obtrusive feature of the climate, occur whenever the wind blows from the sea, which it does most of the time, even in summer. For obvious reasons they seldom or never occur with a land breeze.

The coast of Bering Sea has a climate widely different from that of the Pacific coast. The mean annual temperature is much lower, even after due allowance for the difference in latitude. At St. Michael it is 26°, and at Port Clarence, in Bering Strait, it is 20°. The range of temperature is much greater. The mean temperature of the coldest month at St. Michael is — 2°, of the warmest month 54°, showing a range of 56°. Similarly, at Port Clarence the coldest month is — 11°, the warmest 50°, a range of 61°. The highest temperature on record at St. Michael is 75°, the lowest — 55°, a range of 130°. The contrast with the Pacific coast is still greater in the matter of rainfall, which at St. Michael is very light, amounting to only 14 inches annually. Moreover, rain falls in the warm rather than in the cold season.

The temperature of this coast is not much modified by the sea. Bering Sea is practically a closed sea, the Aleutian Islands forming a partial barrier against the warmer waters of the Pacific; consequently its waters retain, to a large extent at least, the temperature incident to the latitude. Its mean annual temperature is little affected by outside influences, and the greater part of it is frozen for half the year. The extremes of temperature, however, are reduced by the slow absorption and radiation of heat, just as with the Pacific. As this region is north of the territory of the prevailing westerlies, the winds have no preva-

lent direction, but blow whithersoever they list. For the same reason the rainfall is light, and though the air over the sea is saturated with moisture, little of it drifts over the land to supply rain.

If there is a region more infested with fogs than the Pacific coast of Alaska it is Bering Sea. Here fog is the normal condition, and clear, bright weather the rare exception. It is no uncommon experience for vessels bound for the Pribilofs to miss the islands in the fog, and to spend days searching for them, as for needles in a haystack. They are a small target to shoot a vessel at from Unalaska, 250 miles away, and once missed, are easily lost in this great foggy waste.

The climate of the great interior region is that common to the interior of all continents. The mean annual temperature is practically the same as in the same latitude on the coast of Bering Sea, but the range of temperature is much greater. It is warmer in summer and colder in winter, since the land heats and cools much more rapidly than the sea. At the point where the international boundary crosses the Yukon River the mean temperature of the coldest month (in 1889) was —17°, that of the warmest month 60°, a range of 77°. Contrast these figures with those given above for Sitka, where the corresponding range was only 26°. Furthermore, consider that the mean temperature of the warmest month on the Yukon, in latitude 64° 41′, was 4° higher than at Sitka, over 500 miles farther south. These figures are instructive in pointing the conclusion that if any part of Alaska can become of agricultural importance it is the interior rather than the Pacific coast. But it is doubtful whether even this region will admit of profitable farming. In connection with this question the experience of the Canadians is instructive. On Peace River, in latitude 56°, 600 miles farther south, many and persistent attempts at farming have been made, but without financial success, although it is doubtless true that certain crops have been matured there.

The extreme range of temperature in the interior is surprising, even to those accustomed to roast by day and freeze by night in our western deserts. At this same point on the Yukon, tempertures of —60° and of 87° have been recorded—a range of 147°. Again con-

Eskimo at Plover Bay, Siberia

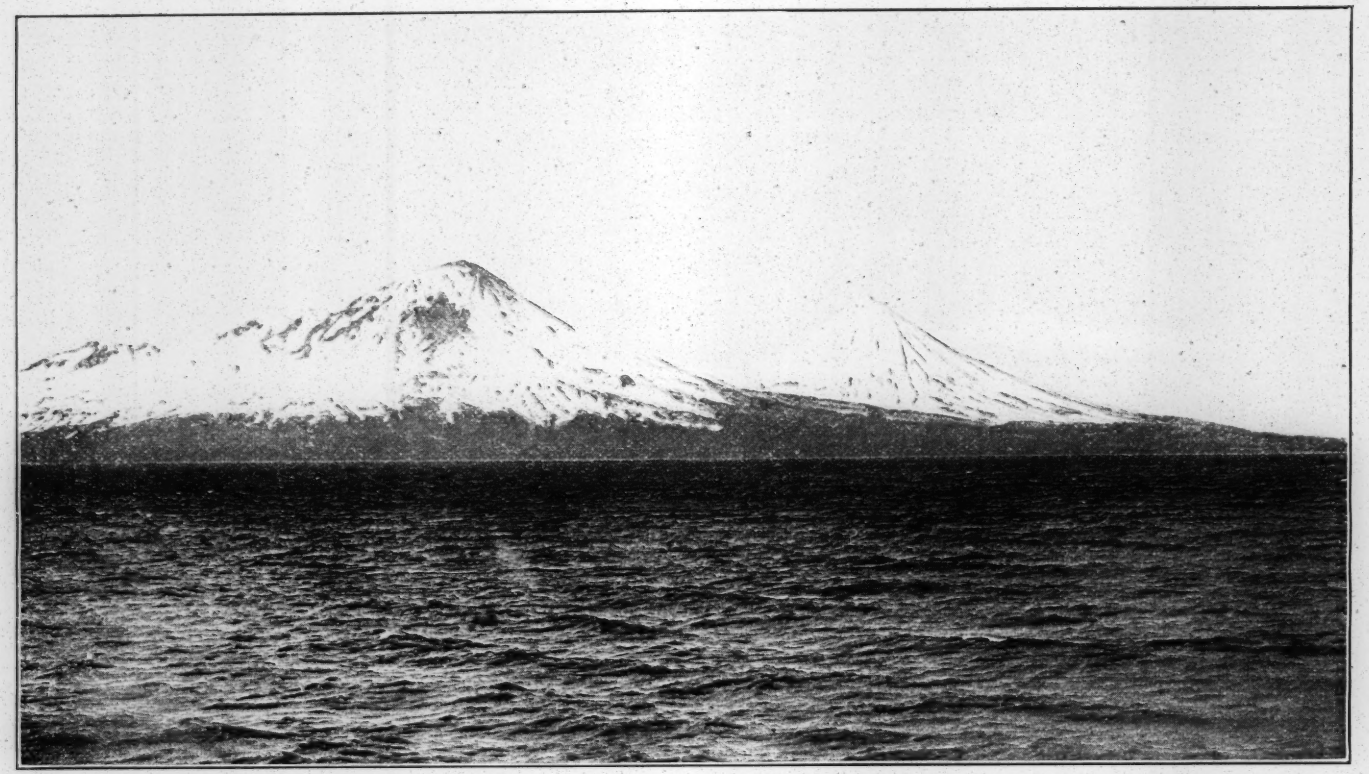


Photo by C. Hart Merriam

Mt. Paulof, Alaska Peninsula

XIIM

trast this with Sitka, where 90° is the extreme range record.

The rainfall in the interior is light, ranging at various places and in different years from 10 to 25 inches. With the cold climate and consequent slight evaporation, it is probably sufficient in the majority of years for agricultural requirements. Differing radically from the coast climates, this climate is bright and sunny. There is little dull, cloudy weather and practically no fog. There is more sunshine here in a month than at Sitka in a year.

FORESTS

The coast, as far to the westward as Cook Inlet, is densely forested up to the timber line, which ranges with the latitude from 3,000 to 2,000 feet above sea-level. The timber is mainly, indeed almost entirely, Sitka spruce. There is some hemlock at higher levels, and in the southern part a little cedar also, but these are of little commercial importance. Red or Douglas fir, which forms the bulk and principal value of the forests of Washington, disappears in British Columbia. The spruce is large and fine, as judged by eastern standards, but as compared with the timber of Oregon and Washington, which is the standard on the Pacific coast, it is inferior, and little use is at present made of it, most of the timber needed being brought from Puget Sound. On Kadiak and the adjacent islands there is little timber, and farther west on the Alaska Peninsula and the Aleutian Islands none whatever, nor are there any trees on the islands in Bering Sea. Why the timber should thus suddenly disappear on the peninsula and islands is an open question. The rainfall is ample, and the climate little more severe than at Sitka and less severe than about Prince William Sound. The suggestion that high, cold winds prevent tree growth is negatived by the fact that such winds occur all along the coast, in forested as well as non-forested parts. Moreover, the forest-fire fiend has not been here.

The interior of the Territory is forested mainly with spruce, as far north as the valley of Koyukuk, and as far westward as the delta of the Yukon. In this enormous region there must be an almost fabulous amount of coniferous timber, sufficient to supply our country for half a century in case our other supplies become exhausted.

POPULATION

The population of Alaska in 1900, according to the Twelfth Census, was 63,592, having nearly doubled in the preceding ten years. Of the total increase, 31,540, about three-fourths was acquired by that portion of the Territory lying north of the Yukon River, and only one-fourth by that portion south of that river, including southeastern Alaska. Half of the increase in northern Alaska consisted of the people of Nome, which had a population of 12,486, by far the largest aggregation of people anywhere in the Territory; the remainder were scattered widely over its great area, but mainly in the valley of the Yukon and along the coast north of the mouth of that river.

In southern Alaska the population increased almost everywhere, but not by any means at as rapid a rate as in certain localities in northern Alaska. Skagway had a population of 3,117; Sitka, 1,396; Juneau, 1,864; Douglas, 825; Wrangell, 868, and the Indian village of Metlakahtla, 465.

Of this total population about 25,000, or a little more than two-fifths, were Indians, Eskimos, or mixed bloods, the remainder being whites. The increase during the past ten years probably consists entirely of whites.

The population is in high degree a floating one, with the slightest possible attachment to localities, and subsequent

censuses will doubtless show radical changes in its location.

RESOURCES

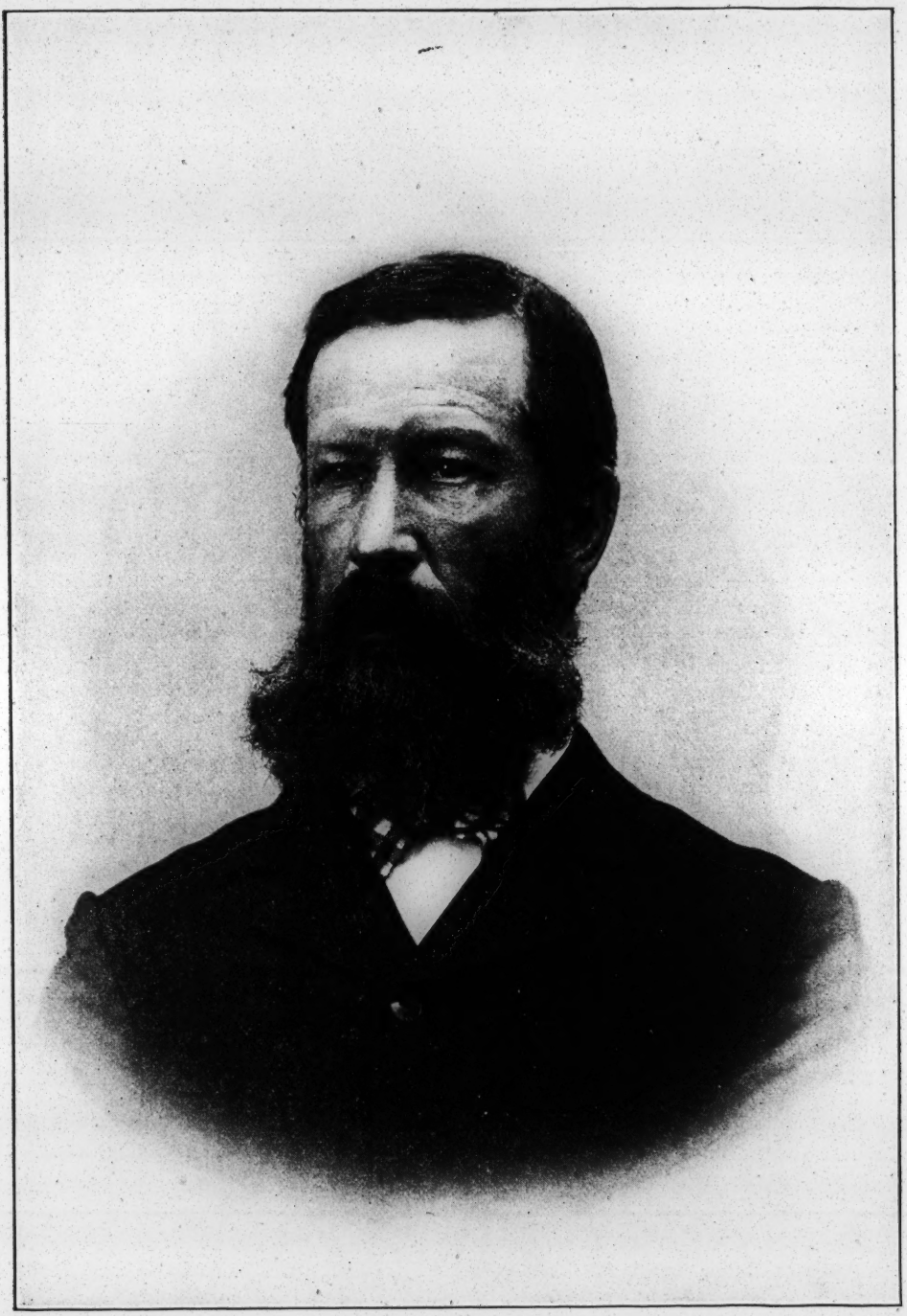
The natural resources of Alaska are enormous. The skins and furs, the fish, the gold, copper, and coal, and the timber of the Territory are in value almost beyond calculation, and the mere reaping of this harvest sown and ripened for us by nature will occupy an industrial army for many years. The wealth thus collected will add greatly to the well-being and happiness of our people.

Some of these natural resources, however, have begun to suffer from the drain to which they have been subjected. The gathering of furs and skins, which has been in progress since the early Russian occupancy of the Territory, has been prosecuted so actively that the fur trade is now of comparatively little consequence. Blue foxes are now so valuable that systematic attempts are being made to breed them for their skins. The sea otter has become very rare, and the value of skins correspondingly high. The fur-seals, on account of pelagic sealing, are now reduced to a small fraction of their former number, and only 24,000 skins were obtained at the seal islands in 1899. Even the great brown bear has become scarce and shy, and hides in the fastnesses of the interior, away from the seaboard, where he was formerly abundant.

The sea-birds, once plentiful all along the coast, are now driven to the rarely visited parts, where, particularly on the islands of Bering Sea, they may yet be found by millions.

Fish are still abundant, but with salmon canneries springing up all along the coast, it is probable that the demand will soon make perceptible inroads upon the supply. During the year 1899 these canneries packed and shipped 1,100,000 cases and 25,000 barrels of this fish.

The mineral resources of the Territory are yet in an undeveloped condition, but unless all signs fail, the chief wealth to be obtained from Alaska will be taken from the ground. Coal is known to exist in many localities, but is nowhere as yet mined on a commercial scale, owing mainly to its inferior quality; the coal in use at present is brought from Nanaimo or Puget Sound. Copper-vein deposits of great magnitude and richness have been found, notably on Copper River and the shores of Prince William Sound, but as yet none of them have been developed beyond the shipping of a few hundred tons of ore for testing. Gold deposits, both placer and vein, have been found in various places all over the Territory. They are so widely distributed and so rich as to lead to the conclusion that with more extended and thorough prospecting, the known auriferous areas will be vastly increased and the yield of the yellow metal multiplied many times. Some of the quartz mines, as the Treadwell, near Juneau, have been worked productively for many years. This mine alone has produced about $10,000,000. Others have recently become productive, and still others, more numerous, are yet in the development stage. The mines near Juneau produced in 1899 gold of the value of nearly two million dollars. At several localities in southeastern Alaska and on the Shumagin Islands quartz mines have been discovered, but at present placers are far more abundant. They have been found on many of the tributaries of the Yukon, especially on those from the south, the Sushitna, the Kuskokwim, and the Koyukuk, and in the north, the Ambler and the Noatak. At several places gold has been found in the beach sands on the seashore, and last, but by no means least, on the beach and the stream-beds at Cape Nome and Port Clarence. These last discoveries seem to be the greatest of the whole northwest, rivaling and probably exceeding the great Klondike dis-



Henry Gannett

covery, for many millions appear to be in sight awaiting the pan or rocker to separate the golden sand. The harvest of gold from Cape Nome during the summer of 1900 was $6,000,000 and the total product of the Territory from placers in 1899 was $1,200,000.

But after the enumeration of these latent resources of the Territory few are left to describe. Alaska is not a country for agriculture, nor for home-making. It has paid us its purchase price many times over, and in the future will pour much wealth into our laps, but it will never pay, as other accessions to our territory have paid, in making homes for our people. At present few people go to Alaska to live; they go there merely to stay until they have made their stake.

Farming as a business is impossible under the climatic conditions prevalent on the coast. It is granted at once that it is possible to mature certain hardy crops in favorable seasons, but this is quite a different thing from raising crops in competition with California and the Willamette Valley, even when the cost of freight is added. It must be done at a profit or not at all. It is of no avail to raise potatoes when they can be brought from Portland and sold for less than the cost of production in Alaska. If there is any part of the Territory in which farming can be successfully carried on, it is the interior, which has a much more favorable summer climate than the coast; but even there success would be doubtful. However, as the higher rate of freight to the interior will have the effect of a protective tariff on home products, it may be possible to raise grain and vegetables at a profit under conditions which would be prohibitory on the coast.

SCENERY

There is one other asset of the Territory not yet enumerated—imponderable and difficult to appraise, yet one of the chief assets of Alaska, if not the greatest. This is the scenery. There are glaciers, mountains, and fiords elsewhere, but nowhere else on earth is there such abundance and magnificence of mountain, fiord, and glacier scenery. For thousands of miles the coast is a continuous panorama. For the one Yosemite of California Alaska has hundreds. The mountains and glaciers of the Cascade Range are duplicated and a thousand-fold exceeded in Alaska. The Alaska coast is to become the show-place of the earth, and pilgrims, not only from the United States, but from far beyond the seas, will throng in endless procession to see it. Its grandeur is more valuable than the gold or the fish or the timber, for it will never be exhausted. This value, measured by direct returns in money received from tourists, will be enormous; measured by health and pleasure, it will be incalculable.

There is one word of advice and caution to be given those intending to visit Alaska for pleasure, for sight-seeing. If you are old, go by all means; but if you are young, stay away until you grow older. The scenery of Alaska is so much grander than anything else of the kind in the world that, once beheld, all other scenery becomes flat and insipid. It is not well to dull one's capacity for such enjoyment by seeing the finest first.

GEORGE M. DAWSON

IN the death of Dr. George M. Dawson the Dominion of Canada has sustained a great loss in the domains of geographic science and of affairs, for Dr. Dawson was not only one of her leading scientific men, but took an active part in her political matters.

Dawson was born at Pictou, Nova Scotia, in 1849, his father being the

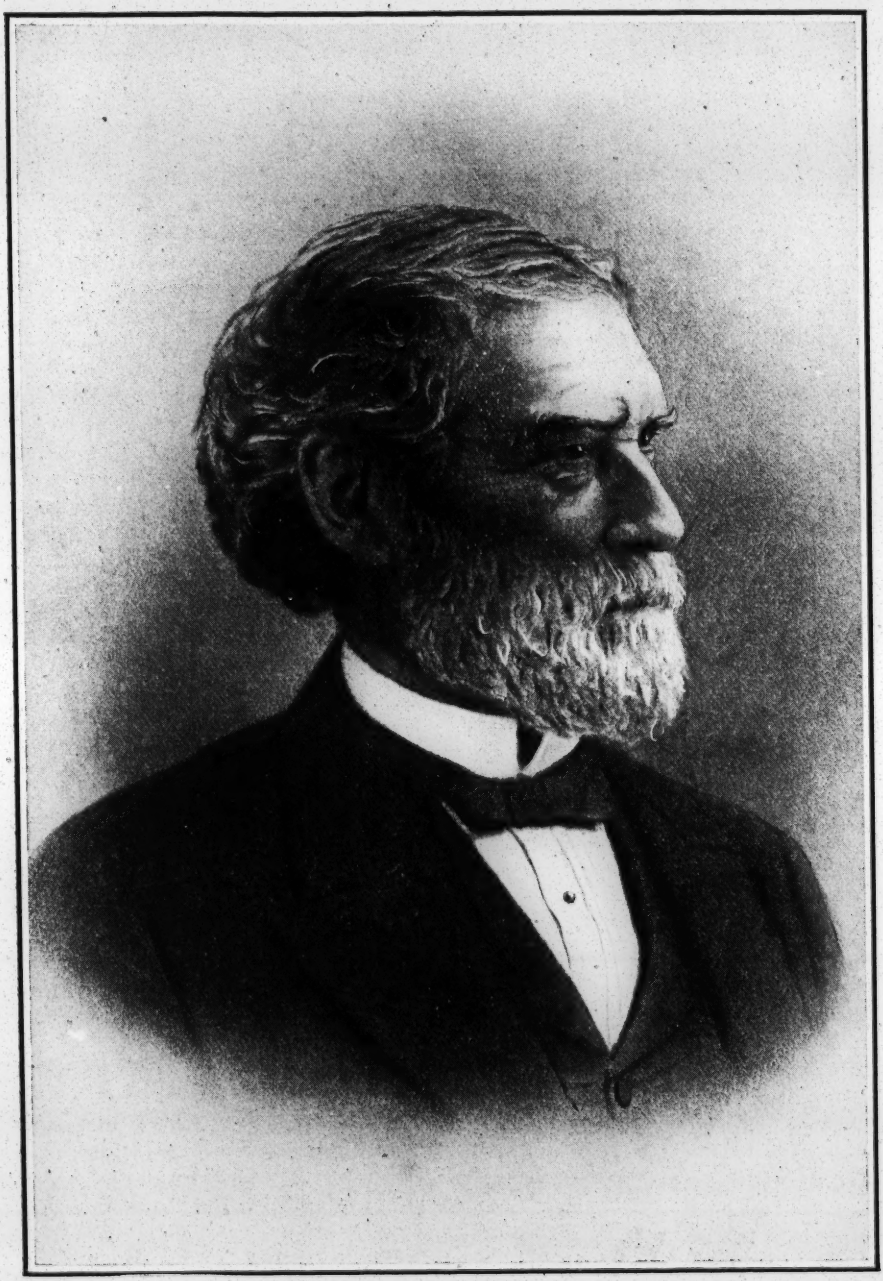
George M. Dawson

celebrated geologist, Sir William Dawson. After a thorough training at McGill University and at the Royal School of Mines of London, he commenced his long career of geographic and geologic explorations as geologist and botanist on the Northwest Boundary Commission in 1873. Two years later he joined the Geological Survey of Canada, and for nine years was engaged in the exploration of British Columbia, the Yukon Valley, and the high plains of the northwest. While his work was primarily geological, still we owe to him, more than to any other explorer, our present knowledge of the northwestern part of North America. In 1883 he was appointed assistant director of the Geological Survey, and in 1895 became its director, which position he held until his death, on March 2, 1901.

During his quarter century of active work many duties were imposed upon Mr. Dawson and many were the honors he received. In 1891 and 1892 he served on the Bering Sea Commission, and for his services received the order of Companion of St. Michael and St. George. In 1891 he received from the Royal Society of England, of which he was a fellow, the Bigsby medal for his researches in geology, and degrees were conferred upon him by Queens College and McGill University. In 1893 he was elected President of the Royal Society of Canada.

Dr. Dawson's work was mainly that of an explorer, and for that he had, in spite of his physical defect, wonderful ability and fitness. To draw broad and accurate generalizations from the slight data obtained by the explorer requires close observation, great breadth of vision, and high reasoning powers, and in the selection of Dawson for this work the Canadian authorities made no mistake. He has laid down with great accuracy the leading geographic and geologic features of the Canadian Northwest, and thus constructed a skeleton on which future work will supply the details.

H. G.



George Davidson

GEOGRAPHIC NOTES

ALASKA

THE narrative volume of the famous Harriman Alaska expedition of two summers ago will appear during the present month. Through the courtesy of Dr. C. Hart Merriam, editor of the volume and of the Harriman publications, the NATIONAL GEOGRAPHIC MAGAZINE is able to present in this number one chapter from this remarkable work—The General Geography of Alaska, by Mr. Henry Gannett.

So rapid has been the exploration of this vast territory during the past five years that few realize the extent of present knowledge of the country. Mr. Gannett, in his paper, gives the most comprehensive statement of the general geographic features as developed by recent exploration that has yet been published.

The narrative of the Harriman expedition is the most trustworthy and at the same time popular work on Alaska which has ever been offered to the public. Mr. John Burroughs opens with the story of the two months' travel of the Harriman party. Mr. John Muir follows with a chapter on the Glaciers. Then Mr. George Bird Grinnell describes the Natives of the Alaskan Continent—the Indians and Eskimo. Dr. Wm. H. Dall gives the History of the Discovery and Exploration of Alaska. Mr. Charles A. Keeler has a chapter on the Birds of Alaska, Mr. B. E. Fernow on the Forests, and then follows Mr. Gannett's article on the General Geography of Alaska. Dr. Merriam contributes the concluding chapter on the Volcanoes of the Aleutian Archipelago. The bird pictures by Mr. Louis Fuertes, the plant pictures by Mr. Walpole, and the fiord scenes by Mr. Dellenbaugh form a notable feature of the volume. Twenty colored plates, over 100 full-page photogravures, and 200 insets illustrate this splendid work. Messrs. Doubleday, Page & Co., of New York, are the publishers for Mr. Harriman.

ANDORRA AND SAN MARINO

THE two states which look strangest upon the map of Europe are the tiny Republics of Andorra, in the eastern Pyrenees, and of San Marino, in northeastern Italy. Each owed its original independence to its strong natural position; then for centuries the shrewdness of its inhabitants knew how to play off one enemy against another. In modern times its neighbors have seemed to feel a sort of chivalric sentiment for it because it has taken care of itself so long.

The Republic of Andorra has existed since the eighth century. When the Moslems invaded France from Spain in the eighth century that little territory in the mountains was not conquered by them and has remained independent ever since. It now enjoys the joint protection of France and of the Spanish Bishop of Urgel. Its extent is less than 175 square miles. Its hardly more than 6,000 inhabitants are almost all miners and farmers. It is governed by a representative council of 24 persons, who are chosen by the heads of families.

The Republic of San Marino, though having a population of about 10,000, is only one-fifth as large in area, but is still more ancient. In fact, it is the smallest and the oldest independent republic on the globe. It is governed by a Great Council of 60 members and a Minor Council of 12 members. It has an army of 938 men, and spends about $10,000 annually on internal improvements. On June 28, 1897, San Marino concluded a formal treaty of friendship with Italy.

GEOGRAPHIC NAMES

THE following decisions were made by the U. S. Board on Geographic Names, April 3, 1901:

Aowa; creek, Dixon County, Nebraska (not Aoway nor Ayoway).

Apple; group of islands in northern part of Sitka Sound, southeastern Alaska (not Iabloshni, Middle, nor Sredni).

Basket; bay indenting the southeastern shore of Chichagof Island, southeastern Alaska (not Kakagin nor Kook).

Bendel; island between Big Koniuji and Nagai Islands, Shumagin group, Alaska (not Morse).

Bois d'Arc; creek, Ellis County, Texas.

Bois d'Arc; creeks (two), Choctaw Nation, Indian Territory.

Bois d'Arc; post-office, Greene County, Missouri.

Bois d'Arc; river in northern Texas.

Bois d'Arc; township, Montgomery County, Illinois.

Broad; island near the junction of Hooniah Sound and Peril Strait, southeastern Alaska (not Crosswise nor Poperetchni).

Buncombe; creek, Chickasaw Nation, Indian Territory (not Boncombe).

Cacaway; island and point, Langford Bay, Kent County, Maryland (not Cacawa).

Camp Coogan; bay in eastern part of Sitka Sound, southeastern Alaska (not Camp Cogan, Camp Kogan, Kadiak, nor Nachlezmia).

Cliffs; point, Chester River, Kent County, Maryland (not Cliff City, Cliff's, nor Starts).

Comet; peak, Pinal County, Arizona (not Camels nor Comets).

Eyak; lake and native village at western edge of the Copper River delta, Alaska (not Eyack, Eyuk, Ighiak, Ikhiak, nor Odiak).

Fryingpan; cove, Eastern Neck Island, Kent County, Maryland (not Boxes nor Frying Pan).

Glenhaven; post-office, railroad station and township, Grant County, Wisconsin (not Glen Haven).

Hauani; creek, Chickasaw Nation, Indian Territory (not Haiyona nor Hiayona).

Hound; island in northern part of Keku Strait, southeastern Alaska (not Round).

Inner; point on the southeastern shore of Kruzof Island, Sitka Sound, southeastern Alaska (not Rocky nor Second).

Koip; peak and ridge on boundary between Mono and Tuolumne Counties, California (not Ko-it).

Leechville; post-office and village, Beaufort County, North Carolina (not Leachville).

Leevining; cañon, creek, and peak, Mono County, California (not Levining nor Vining).

Luppatatong; creek in Keyport, Monmouth County, New Jersey (not Lupatatong, Lupatcong, nor Luppatcong).

North Gabouri; creek, Ste. Genevieve County, Missouri (not North Gabor nor North Gabori).

Oraibi; post-office and village, Navajo County, Arizona (not Oraiba).

Piute; peak and post-office, Kern County, California (not Pah-ute, Pahute, nor Paiute).

Rockhall; district No. 5, Kent County, Maryland (not Edesville).

Shoshone;* river, tributary to the Big Horn River, Big Horn County, Wyoming (not Stinking Water).

*The legislature of the State of Wyoming passed an act, which was approved February 14, 1901, as follows:

"*Be it enacted by the legislature of the State of Wyoming:*

"SECTION 1. That the name of the stream of water known on the map of the United States as the Stinking Water River, situated in Big Horn County, Wyoming, and emptying into the Big Horn River, is hereby changed to the Shoshone River, and shall hereafter be designated and known as such.

"SEC. 2. This act shall take effect and be in force from and after its passage."

Scraggy; isletin Salisbury Sound, southeastern Alaska (not Samoilof).
Shoals; point, the southeastern point of Kruzof Island, Sitka Sound, southeastern Alaska (not First, Low, Nizmennia, Otmeloi, Outer Point of Shoals, nor White's).
Smoke; creek south of Buffalo, Erie County, Pa. (not Smokes).
South Gabouri; creek, Ste. Genevieve County, Missouri (not South Fork Gabor nor South Gabori).
Turner; island between Big Koniuji and Nagai Islands, Shumagin group, Alaska (not Stiernfeld).
Wapsipinicon; river in eastern Iowa (not Wabes-pinicon Wapsie nor Wapsiepinnecon).
West Point; city, militia district, and post-office, Troup County, Georgia (not Westpoint).
West Point; district, post-office, and town, King William County, Virginia (not Westpoint).
Wosnesenski; island off south shore of Alaska Peninsula and west of Unga Island, Shumagin group, Alaska (not Crested, Peregrebnoi, Unatkuyuk, Vozoychenski, Vossnesensky, nor Wossnessenski).
Yucaipe; creek and valley, San Bernardino County, California (not Yucaipa).

GERMANY IN CENTRAL AMERICA

THE rapid increase of German commercial interests in Central America has recently led Germany to appoint her first salaried consul to Central America. The consul has been accredited to Nicaragua, as the probable construction of the canal across the Isthmus will make it the most important of Central American countries.

The trade between Germany and Central America annually reaches from $7,140,000 to $11,900,000. German companies practically control the entire shipping of the coast, and $59,500,000 of German capital is invested there in real estate, industrial enterprises, and in banking houses. German farms and plantations cover more than 742,000 acres, on which are planted 20,000,000 coffee trees. Much of the trade of Central America goes abroad instead of coming to the United States, owing to the fact that American houses do not employ in their establishments persons speaking Spanish, and refuse to give credit.

A SUBMARINE ARCTIC BOAT

A UNIQUE submarine boat is now being built at Wilhelmshaven, Germany, designed not for war, but for the search for the North Pole. Herr Anschütz-Kämpfe, of Munich, the inventor, recently described his plans at a meeting of the Vienna Geographical Society.

The boat will be capable of descending to a depth of 160 feet, and of swimming at that distance from the surface, and can remain fifteen hours under water. The vessel is in the form of an ellipsoid of rotation, the major axis being 70 feet and the breadth 20 feet. Its cubical contents will allow sufficient air for five men for fifteen hours, the carbonic acid gas being removed by combination with caustic soda. The boat is kept from rising by vertical screws of five-horse power, and is propelled by horizontal screws of forty-horse power. A petroleum motor supplies the necessary power.

When ready for the start the boat will be towed to the edge of the ice near Spitzbergen, about 600 miles from the Pole. The inventor's argument for the rest of the journey is as follows: The polar ice, on the average, reaches to a depth of 16 to 20 feet, but when packed it may reach to a depth of 80 feet (land ice in the form of icebergs, which extend several hundred feet below water, may, he thinks, be disregarded in this

region). The extent of ice-fields rarely exceeds three miles, and as the vessel can make three miles an hour under water and can remain fifteen hours, he believes there will be no difficulty in swimming from opening to opening of the ice-fields. The possibility of meeting reefs of rock rising toward the surface or of sand banks he considers so slight as to be disregarded.

If after proceeding six hours under water the vessel finds no opening it will rise to the ice and search for a thin spot, and if blasting cannot effect an outlet there will be plenty of time to return to the last opening.

WORK IN THE ARCTICS IN 1901

NOT since the years of the Franklin search expeditions has there been such activity directed toward the north and south polar regions as during the present year. Not less than eight expeditions are now in the far north or are planning for active work in Greenland, Spitzbergen, and Franz Josef Land, and of these, five—Baldwin, Peary, Sverdrup, Bernier, and Anschütz-Kämpfe—are aiming for the North Pole.

Peary passed his third consecutive winter in the vicinity of Smith Sound, and is now probably sledding toward the Pole. In July the Peary Arctic Club of Brooklyn will dispatch for the third time a relief ship to carry him supplies and to bring him back if he this year reaches his goal. If unsuccessful he remains another year. Peary is not yet informed that the Duke of Abruzzi last year eclipsed Nansen's record. Mrs. Peary, with her little daughter, went north in the Peary relief ship of 1900, hoping to join her husband.

Sverdrup's plans for this summer are a mystery, as they were in 1900. He is probably pegging away in northeastern Greenland. He also has passed his third consecutive winter in the far north, but no vessel has taken him supplies in the meantime, and probably he will be obliged to return in September.

Baldwin inaugurates the most important arctic expedition of the year. The primary object of the *Baldwin-Zeigler* party is avowedly to get to the Pole. Scientific work is secondary, but the equipment of the party is so complete that much valuable data will undoubtedly be obtained. Prof. J. Howard Gore, the well-known physicist of Columbian University, accompanies Mr. Baldwin as far as Franz Josef Land, where he will spend the summer in work, and return on the second ship, the *Fridtjof*. The names of the scientific men who will remain permanently with the party have not yet been announced.

Mr. Baldwin intends to make some interesting experiments in the matter of food. He is taking a quantity of desiccated potatoes; also quantities of "fruit bricks," with which the Department of Agriculture has experimented so successfully. Bushels of strawberries, raspberries, etc., can thus be compressed into solid form and retain their freshness until used months later. Four hundred picked Siberian dogs will be taken, which is four times as many as the Duke of Abruzzi had with him and twelve times the number Nansen took. The bottoms of the kyaks and sled-runners, which were constructed in Norway, are lined with German silver, which Mr. Baldwin believes will afford the best protection against water and ice.

The *Amerika* and *Fridtjof* will steam north together as far as the ice permits, when the stores of the *Fridtjof* will be transferred to the *Amerika* and to a convenient point on Franz Josef Land, and the smaller ship returns to Tromsö.

A Russian Party, on a vessel of the type of the ice-breaking *Ermak*, will push northward as far as the powerful vessel can crush its way. A large staff of scientists will conduct observations during the trip, as the main purpose of the expedition is scientific. The *Ermak*,

with boilers under half pressure, can force her way through polar ice of 12 to 14 feet thickness at a rate of nearly 3 knots an hour. This type of vessel may prove an important factor in ultimately reaching the pole.

Captain Bernier, of Quebec, has adopted essentially the plan Nansen has urged of approaching the Pole from Bering Sea, between 165 and 170 degrees east longitude, and then drifting toward the Pole. Captain Bernier does not expect to set out this year, but is making arrangements for an expedition to start in 1902.

The widely circulated statement that the **Duke of Abruzzi** would send a special vessel northward in July to search for the three members of his party who were lost in Franz Josef Land in March, 1900, is unfounded. The whaling steamer *Capella*, which every summer goes northward, toward the end of July will stop incidentally at Franz Josef Land to see if it can find traces of the missing men, but the Italian prince has no connection with the plan.

Walter Wellman has purchased a whaling steamer in which he hopes soon to lead a third arctic expedition. The party may start this year or wait till the summer of 1902.

The project of **Herr Anschutz-Kampfe** of attaining the North Pole by means of a submarine boat has been alluded to on page 201.

WORK IN THE ANTARCTICS

PLANS are under way for five expeditions to southern regions, two of which—the English and the German—set out in July, in costly ships specially constructed for the purpose.

The *Discovery*, the first ship ever constructed in England for purely exploratory work, was recently launched on the Firth of Tay. The *Discovery*, which is the vessel of the **English Antarctic Expedition,** is the sixth of her name in the annals of British exploration. The first *Discovery* carried Hudson to Hudson Bay in 1610, on the ill-fated voyage when his crew mutinied and abandoned him in a tiny boat to perish on the great bay which he had discovered. The second of the name one hundred years later made a voyage to Hudson Bay. The third was the second ship in Cook's third voyage, in which he discovered the Hawaiian Islands, only to be murdered there a few months later. In the fourth Vancouver explored the Gulf of Georgia and the shores of the island which bears his name—1791–'95, and the fifth was the second ship of the Arctic expedition of Sir George Nares.

The present *Discovery* is as staunchly built as experience and science can make her. She is a combined sailing and steam vessel, with engines of 450-horse power, and will be able to steam about eight knots an hour. At the water line she is 170 feet in length, with an extreme breadth of 33 feet; her mean draft is 16 feet and her displacement 1,750 tons.

Captain Scott will have under him four other officers, two of them belonging to the navy and two to the Royal Naval Reserve. The second in command will be Lieutenant Armitage, whose three years' experience in Franz Josef Land with Jackson should be of immense service, especially if he is placed in command of a land party. There will be three civilian scientific specialists and two medical officers, both of them qualified to undertake certain departments of scientific work. The petty officers and crew will number about 25, so that the complete complement of the *Discovery* is not likely to exceed 40. There will be some 20 sledges and 20 dogs, some of the sledges being light enough to be easily drawn by men.

The *Gauss*, for the **German Antarctic Expedition** (named after the Göttingen professor who did so much to stimulate

Antarctic research), was launched at Kiel early in April. The German ship, like the *Discovery*, is built mainly of wood, the only material which is elastic and strong enough to resist ice pressure and the boisterous seas of the south polar regions. She is some twenty feet shorter than the English vessel, but is broader, and her displacement is 300 tons less. The crew will consist, in addition to Dr. von Drygalski, of four scientific assistants, a captain, a first officer, two mates, an engineer, ten seamen, six assistant engineers and stokers, a cook, and a steward—28 in all. Each of the officers has a cabin to himself, while the crew have four large rooms. All the dwelling-rooms will be heated by steam, and it is calculated that a temperature of 50° Fahr. will be maintained within when that outside is as low as — 22°. Electric light will be provided throughout practically the whole ship, and an acetylene apparatus may possibly also be installed. Laboratories and other special arrangements are provided for scientific work, while, as in the British ship, dredging and sounding apparatus have been provided. Dr. von Drygalski is planning to take 50 dogs. He, as well as the English captain, has included a balloon in the equipment.

A map showing the routes of the English and German expeditions was published in this Magazine, in No. 8, vol. x. The English expect to establish a station on Cape Adare, Victoria Land, which will be the base of their land parties, while the Germans plan to make their base on some point in Wilkes Land. Each vessel will carry sufficient stores for 3 years, as it is probable that each party will remain that time within the Antarctic Circle.

The Swedish Antarctic Expedition, under Dr. Otto Nordenskjold, has engaged the *Antarctic*, the vessel with which Dr. Nathorst made his notable explorations on the east coast of Greenland in 1899. This party may possibly leave in September, but the chances are that they will not set out until 1902.

Plans for the **Scottish Antarctic Expedition** are progressing. This expedition will probably not set out until the year 1902.

The **Duke of Abruzzi** is organizing a south polar expedition to start in June, 1902. He is enthusiastically supported by all Italians.

AN AMERICAN FLOATING EXPOSITION

THE suggestion for a floating exposition made by the Chief of the Bureau of Statistics of the Treasury Department in the February number of this magazine has aroused much discussion not only throughout the United States, but in other parts of the world. Mr. Austin has received letters from various countries in Europe asking about the proposed enterprise, and many inquiries from manufacturers and merchants in the United States desiring to participate in an undertaking of this character.

This suggestion of Mr. Austin has been followed by the announcement that a floating exhibition, to visit the cities bordering upon the Gulf of Mexico and Caribbean Sea, has been organized at Buffalo, and will leave in the autumn of the present year for that field. A number of other enterprises of this character have also been suggested.

The Bureau of Statistics has received the following statement, published in the *Moniteur Officiel du Commerce* (Paris, March 28, 1900), regarding a floating exposition recently organized in Hamburg, Germany:

"The earliest exhibition of this kind was organized about two years ago, and it must be said that the results of the enterprise were in excess of the most sanguine expectations: Total value of transactions, 22,000,000 marks ($5,236,000), at a cost of about 800,000 marks, or about $190,400. The details of opera-

tion are stated by the correspondent as follows:

"'The syndicate addresses to manufacturing and commercial firms circulars explaining the purpose of the exhibition and the terms of participation. As soon as the number of would-be participants is large enough to permit the loading of a vessel, the exhibitors send their samples to the port of departure. These samples are then mounted and exhibited on board the vessel, especially fitted for this purpose.

"'By each exhibit there is an advertisement giving prices and terms of sale. Sales agents representing either the syndicate or the individual exhibitors furnish all desired information to the visitors at the various ports where the vessel stops. These sales agents are chosen from among the young men, as well as the young women, graduated from commercial schools and speaking at least two languages. Interpreters are hired on the spot in each country of a new language. The sales agents, besides seeing visitors aboard the ship, visit also with their samples the towns in the interior of the country. In such manner the cost of transportation is greatly reduced.

"'The exhibitors pay to the syndicate a commission, to be deducted from the realized sales and in proportion to the value of the product. In addition to this commission, the participants pay a proportionate share of the cost of chartering and loading the vessel and the general expenditure of the undertaking, such as the hire of clerks, interpreters, etc.'

"The report concludes with the expression of the hope that French commercial circles would appreciate this novel idea and try to achieve even more splendid results."

Announcement of an Austro-Hungarian floating exposition to leave Trieste this month for a voyage around the world was made in the preceding number of this Magazine.

POPULATIONS OF AUSTRIA-HUNGARY, DENMARK, AND SWITZERLAND

THE figures for the census of Austria-Hungary, taken in December, 1900, show an increase for the past ten years of about 10 per cent, a more rapid growth than the dual kingdom has experienced for several decades. The population is about 46,890,000, which makes her the seventh country in the world in population. Those outnumbering her are China, the British Empire, the Russian Empire, the United States, France, and the German Empire. Japan has a million or two less.

The Danish census was taken February, 1901, and shows an increase during the last eleven years of 12½ per cent, which is greater than in any recent decade. This increase is mainly due to the diminishing number of emigrants and to the decrease in the death rate, brought about by the efforts of the government to prevent the spread of consumption. As in the other countries of Europe, the people are moving into the towns. The towns show an increase of 28 per cent, while the country districts show an increase of only 4 per cent. The present population of Denmark is 2,447,441.

The census of Switzerland, taken December 1, 1900, gives the population of the republic as 3,312,551, an increase of 13.5 per cent during the twelve years since the preceding enumeration.

THE CONQUEST OF CHINA

"I KNOW not in what fable I have read about some fishermen who had disembarked upon an unknown island and had already begun to set up their tents and to sow their grain, feeling great pride in their unexpected acquisition, when, all at once, they found themselves hurled into the water—they and their implements—so that the greater

part of them were drowned. They had set foot upon a huge slumbering whale, which had subsequently waked up when the first incursions had been made on his body by the newly arrived occupants.

"This is a fable, but I fear it may become history when it is applied to the mistaken calculations of the European powers as to the occupation of China."

Thus Cesare Lombroso in a recent contribution to *The Evening Star* (Washington, D. C.) describes the Chinese problem. He believes that the Chinese are a different, not an inferior, race; that they are now lazily dormant, but will soon be exasperated by European oppression and excited to fearful rebellion that will wreck everything foreign in the empire. He agrees with M. De Bloche, the famous Russian advocate of international arbitration and the inspirer of the Peace Conference, that there is a still greater peril, namely, that when the Chinese have been badgered and harassed beyond even Chinese patience, as a last resource they will throw themselves into the arms of Japan. Such an alliance would menace the rest of the world, for Japan loves Europeans only so long as she can learn from them.

The Manchurian Railway the Russian Government hopes to complete during the current month, states the American consul at Moscow. Working trains are already running between Onon, Harbin, Vladivostok, and Port Arthur. Thus in a few weeks trains will run from St. Petersburg to Port Arthur with only one small break—the few miles around Lake Baikal, where heavy boats ferry the cars across the lake. A map showing the route of the Manchurian Railway was published in No. 8, vol. xi of this Magazine.

The Survey of Greece, which has been interrupted since the Greco-Turkish war, is to be resumed this spring under the direction of Heinrich Harti, a professor at the Vienna University. Professor Harti was summoned to Athens last autumn to inspect and take charge of the topographical bureau which he founded some years ago. It is feared that the cadastral survey by communities which has been ordered will not be successful, as the people object to the demarkation of boundaries. Professor Harti, however, hopes to be able to make a general survey of sufficient accuracy to make a map of the whole kingdom on a uniform system.

Explorations in Alaska. — The U. S. Geological Survey will send this summer three important expeditions for exploratory work in Alaska. The first, under W. J. Peters, will start from Bergman, nearly 1,000 miles northwest of Sitka, and proceed to the Arctic Ocean. The party hopes to advance eastward as far as the British boundary, and then will turn westward again and proceed toward Point Barrow. The second party, led by W. C. Mendenhall, the geologist, will work around Kotzebue Sound. The third party, led by Mr. Gerdine, will continue previous explorations in the region of the Copper River.

The War Department sends no expedition to Alaska, as its resources are fully occupied by Cuba, Porto Rico, and the Philippines.

The Biological Survey of the Department of Agriculture will send this summer parties to the region of Athabasca Lake and the Great Slave Lake to determine the zones of distribution of the fauna of that country. Mr. Preble, who so successfully led the party from the Survey to the Hudson Bay country last year, has charge of the work. Dr. C. Hart Merriam, the chief of the Survey, continues his study of the zones of distribution of the fauna of California.

The new director of the Geological Survey of Canada is Dr. Robert Bell,

formerly the senior member of the staff of the Survey. Dr. Bell, since he joined the Survey, in 1857, has made surveys, both topographical and geological, in almost every section of Canada.

Three expert geologists of the U. S. Geological Survey are now engaged in making an examination into the mineral resources of Cuba. The work is very important, and may result in much economic value to the island. It was undertaken at the suggestion of Governor-General Wood, and all of the expenses will be met by the Cuban government.

The U. S. Coast and Geodetic Survey has five parties in Porto Rico charting the coast of the island. This work has now been in progress for two years, and great advance has been made in obtaining accurate charts of the coastline. Several local harbor charts of the Hawaiian Islands are being published by the Survey, the result of surveys made in 1899 and 1900.

GEOGRAPHIC LITERATURE

Where Black Rules White: A Journey Across and About Haiti. By Hesketh Prichard. Illustrated. 8vo, pp. [i–xi +] 1–288. New York: Chas. Scribner's Sons, 1900.

Made attractive by a tasty symbolic binding, clear type, thick and large paper, fair half-tone reproductions of photographs, and excellent press-work, this book is a convenient outline of its writer's knowledge concerning one of the most interesting portions of the western hemisphere—the only considerable portion which has ever reverted from Caucasian rule to the dominion of an alien race. The fifteen brief chapters are based mainly on the observations of a single visit; although interesting historical details are interwoven here and there, there is nothing in profession or performance to indicate that the author was inspired by the instincts of the historian, and much to indicate that he was not geographer or geologist, naturalist or artist, ethnologist or sociologist, economist, or even serious student—but just a tourist bent on writing a book. So the chapters are light if not frothy, the expressions youthful if not flippant; yet the vocabulary is remarkably rich and the word-painting singularly vivid, and the narrative smacks of the soil throughout. The author pays tribute to Toussaint L'Ouverture as the one noble figure in Haytian history, but shows that the bloodthirsty Dessalines is the local hero; he summarizes the history of black rule as one of steady lapse from civilization to barbarism if not to savagery, and is correspondingly pessimistic as to the future of the island; he ascribes the progressive degradation partly to the incompetence of the masses, partly to the corruption of the classes, but mainly to the persistence of the Vaudoux cult with its depressing beliefs and ghastly ceremonies running down to serpent-worship and human sacrifice. The book is material for knowledge of Haiti—material rather meager and tenuous, perhaps, but direct, useful, and happily dressed. W J M.

China. By James Harrison Wilson. Third edition. With map. 8vo, pp. xxxvii + 1–422. New York: D. Appleton & Co. 1901.

For many years General Wilson's work on China has been a standard authority. The third edition includes an account of the Boxer War and of the diplomatic conferences of last fall.

General Wilson believes that Japan will be forced to follow the lead of the three great European powers—France, Germany, and Russia—in all Chinese questions. Russia occupies an impregnable position, and will dictate her policy to France, and thus indirectly to Germany. A few hundred years from now, General Wilson believes that "universal empire will have its nucleus and seat" in China, as her "coal measures and iron deposits are commonly believed to be the most extensive and the most enduring in the world." That it will be an empire of white men and not of yellow men is the author's unhesitating conviction.

The Land of the Moors. By Budgett Meakin. Illustrated. 8vo, pp. 464. New York: The Macmillan Co., 1901.

Mr. Meakin was for some years editor of the *Morocco Times*, and is the author of a number of reliable books relating to the Moorish Empire—"The Moors," "The Moorish Empire," etc. The present volume deals more especially with the geographic features and the history of the exploration of Morocco. There are good chapters on the Physical Features, Mineral Resources, Vegetable Products, and Animal Life. The book is timely, as "the land of the Moors" will probably be the center of much diplomatic warfare during the next decade. The apparent alliance between Italy and France undoubtedly has some bearing upon the ultimate fate of the country. The author believes that "France is the normal heir to Morocco whenever the present empire breaks up," and thinks that England should make up her mind to the inevitable fact.

PROCEEDINGS OF THE NATIONAL GEOGRAPHIC SOCIETY

Meetings.

April 12, 1901.—The annual reception of the Society was held in the parlors of the Arlington Hotel. Mr. Paul Du Chaillu was the guest of honor of the Society, and gave some interesting reminiscences of his life. The official, diplomatic, and social life of the Capital were the guests of the Society during the evening.

April 19, 1901.—President Graham Bell in the chair. The new by-laws for the Society, submitted and recommended by the Board of Managers, after a full discussion were unanimously adopted. The by-laws and the reasons for their adoption were published at length in the April number of this Magazine (pp. 167–'8).

Announcements.

The President announced at the meeting April 19 that the plans for the building which is to be the headquarters of the Society are advancing, and that it is hoped in a few weeks active work will be commenced.

THE ANNUAL EXCURSION AND FIELD MEETING of the Society will be held at Brandywine, Del., Saturday, May 18.

As the fiscal year of the Society will hereafter begin the first of January instead of the first of June, the Board of Managers have voted to fix the dues of members for the seven months which intervene between the end of the present fiscal year, May 31, 1901, and the beginning of the next fiscal year, January 1, 1902, at $1.

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